Prevention of Significant Deterioration Construction Air Permit Application Kraft Mill Optimization

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1.0 Introduction

AbiBow US Inc. (AbiBow) manufactures coated paper and market pulp at their Catawba, South Carolina facility. In late August 2003, AbiBow began operations of a new Fiberline and Bleaching System to comply with the pulp and paper Cluster Rule. The new Fiberline system allowed the facility to produce kraft pulp more efficiently and environmentally friendly. The fiberline was modified in 2006 to increase pulp quality and production. This permit application is for kraft mill upgrades to optimize the pulp yield.

The South Carolina Department of Health and Environmental Control (SCDHEC) application forms are contained in Appendix A.

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2.0 Project Description

The optimization project will increase the yield from the kraft mill using the same amount of raw materials (wood and cooking liquor) to produce more tons of pulp. The project includes modifications to the kraft pulping system, evaporator system, and chlorine dioxide plant (part of the bleaching system).

No modifications to recovery furnaces, smelt dissolving tanks, lime kiln, causticizing area, or woodyard are necessary since no additional wood fiber or cooking liquor is required, and consequently no additional black liquor solids are generated.

2.1 Kraft Mill Pulping System

The modifications to the kraft pulping system will consist of the following:

- New oxygen mixer and booster pump
- New oxygen reactor (1B)
- Increased brownstock washing shower (wash) water

The kraft pulp mill will be modified to increase the yield from the digester by raising the Kappa and shifting more delignification from the digester to the oxygen delignification system. This will be accomplished by installing a third oxygen reactor, with the associated mixer, booster pump, and piping, between the existing No. 1 and No. 2 oxygen reactors.

These changes will reduce steam demand at the digester and yield more pulp from the same amount of wood and cooking liquor. The increased yield will lower the black liquor solids generated per ton of pulp and will also lower the liquor heating value. The increased wash water is required for oxygen delignification efficiency and generating more weak black liquor. The increased yield and change in Kappa will increase demand for chlorine dioxide in the bleaching system.

Based on the PSD construction permit issued in 2006 (2440-0005-DA), the kraft pulping system is projected to produce 1,825 air dried tons unbleached pulp (ADTUP) per day. The proposed modifications do not increase the projected future production beyond the level projected in construction permit DA. A pulping system process flow diagram is contained in Appendix B, as Figure B-1.

2.2 Kraft Mill Evaporator System

The modifications to the Kraft mill evaporator system will consist of the following:

- Replace existing No. 3 evaporator evaporative condenser (heat exchanger) with new surface condenser (heat exchanger)
- New No. 3 evaporator NCG gas cooler
- New No. 3 evaporator NCG ejector condensers
- New No. 3 evaporator hotwell
- No. 3 evaporator pump upgrades and replacements
- New No.1 evaporator liquor heat exchanger and transfer pump
- No. 1 evaporator pump upgrades

The evaporator modifications will increase the surface area for evaporation available to process the additional weak black liquor from the fiberline. The increased evaporation will require additional steam, which will be offset by the efficiency gained from the replacement of the No. 3 evaporator condenser, as well as improved heat transfer from the new No. 1 evaporator heat exchanger. A process flow diagram is contained in Appendix B, as Figure B-2.

2.3 Bleaching System (Chlorine Dioxide Plant)

The chlorine dioxide plant is part of the kraft bleaching system. The chlorine dioxide plant will be modified to increase production to support bleaching the additional pulp production. The modifications to the chlorine dioxide plant will consist of adding a filtrate separation system surge tank with associated pumps and piping. The addition of a filtrate separation system will reduce the evaporation load in the generator to enhance process stability over the range of operating conditions and production rates.

The modifications are projected to increase production to 40 tons per day of chlorine dioxide. Based on the PSD construction permit issued in 2006 (2440-0005-DA), the bleaching system is projected to produce 1,752 air dried tons unbleached pulp (ADTUP) per day. The proposed modifications do not increase the projected future production of the bleaching system beyond the level projected in construction permit DA. A process flow diagram for the chlorine dioxide plant is contained in Appendix B, as Figure B-3.

2.4 Changes to Steam Demand

The proposed project is expected to result in a slight, but negligible reduction in mill steam demand. The proposed modifications to kraft pulping system are expected to reduce steam demand at the digester by approximately 3,982 pounds per hour. The additional weak black liquor from the kraft pulping system is expected to require approximately 9,909 pounds per hour of additional steam at the evaporators. The evaporator heat exchanger modifications are expected to reduce steam demand at the evaporators by approximately 7,237 pounds per hour. The bleaching system is expected to require approximately 1,302 pounds per hour of additional steam to process the additional pulp. The net effect of the project is a slight reduction in steam demand of approximately 8 pounds per hour.

2.5 Market Pulp Dryer (not modified)

The additional pulp available as a result of the proposed project is expected to be sold as market pulp. The pulp dryer will not be modified as a result of this project, so the projected actual emissions for the pulp dryer will be based on adding the additional production due to the project to the historical best month of production during the 24-month baseline. Market pulp is sold as machine dry tons (i.e., as is) since the purchaser adds water to repulp the product prior to converting into final products. The pulp dryer steam usage is not expected to change as a result of the additional production because additional steam increases costs, so the moisture content of the market pulp will be allowed to increase slightly.

3.0 Applicable Regulations

3.1 40 CFR Part 63, Subpart S (National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry)

The AbiBow Catawba mill is regulated by the Part 63 NESHAPs for the Pulp and Paper Industry (Subpart S). The kraft pulping system is already considered a new source under this regulation and meets all Subpart S requirements. The kraft mill evaporators are existing sources and are also regulated under Subpart S.

The MACT standards for kraft pulping and evaporator systems (63.443) allow AbiBow to select one of several options for treatment.

- Reduce total HAP emissions by 98 percent or more by weight;
- Reduce total HAP concentration at the outlet of the thermal oxidizer to less than 20 ppm by volume on a dry basis at 10 percent oxygen;
- Reduce total HAP emissions using a thermal oxidizer operating at minimum temperature of 1600°F with a minimum residence time of 0.75 second; or
- Reduce total HAP emissions by introducing high volume low concentration (HVLC) and low volume high concentration (LVHC) gases into the combustion zone of a boiler, lime kiln, or recovery furnace.
- Collect kraft pulping condensates (11.1 pounds of HAP per ton of pulp production) and reduce 92 % of HAP or remove 10.2 pounds of HAP per ton pulp (HAP measured as methanol)

In addition, the treatment device used to control HVLC gases must be operational a minimum of 96 percent of the operating time during the reporting period, excluding periods of startup, shutdown, or malfunction (SSM) (63.443(e)(2)). The LVHC gases are required to be incinerated 99 percent of the operating time, excluding SSM periods. AbiBow combusts the LVHC and HVLC gases in the two facility combination boilers. The kraft pulping condensates must be collected and treated 90% of the time. AbiBow uses a condensate stripper to remove HAP from the wastewater.

The MACT standards for bleaching systems (63.445) allow AbiBow to select one of several options for treatment.

- Reduce chlorinated HAP emissions by 99 percent or more by weight;
- Reduce chlorinated HAP concentration at the outlet of the control device to less than 10 ppm by volume;
- Achieve a post control device chlorinated HAP mass emission rate of 0.002 pounds per ton of pulp.

Monitoring requirements have already been established in accordance with Cluster Rule 63.453(b).

3.2 40 CFR Part 60, Subpart BB (Standards of Performance for Kraft Pulp Mills)

The total reduced sulfur (TRS) emissions from the kraft digesting system and condensate stripper are regulated by 40 CFR 60, Subpart BB. The digester system and condensate stripper emissions are collected and burned in the combination boilers, meeting the control requirements under 60.283(1)(iii).

The pulp washing system uses a pressure diffusion washer, which is exempted from Subpart BB applicability (60.281(e)). However, the pressure diffusion washer vents to the blow tank, which is included in the digester system definition, so the pulp washing system TRS emissions are controlled.

The No. 1 and No. 3 evaporator sets are regulated under Subpart BB since they were modified (No. 1 evaporator) or constructed (No. 3 evaporator) following the applicability date. The evaporator system emissions are collected and burned in the combination boilers, meeting the control requirements under 60.283(1)(iii).

The other components of the kraft pulp mill (oxygen delignification and knotting and screening systems) are not regulated units under 40 CFR 60, Subpart BB. There are no requirements for bleaching systems in 40 CFR 60, Subpart BB.

3.3 South Carolina Regulation 62.5, Standard No. 1 (Emissions from Fuel Burning Operations)

Standard No. 1 does not apply because the project does not involve modifications to any fuel burning sources.

3.4 South Carolina Regulation 62.5, Standard No. 2 (Ambient Air Quality Standards)

The air dispersion modeling analyses described in Section 6 of this application address all applicable ambient air quality standards.

3.5 South Carolina Regulation 62.5, Standard No. 3 (Waste Combustion and Reduction)

Standard No. 3 does not apply because the project does not involve waste combustion as defined in the regulation.

3.6 South Carolina Regulation 62.5, Standard No. 4 (Emissions from Process Industries)

The processes being modified are currently subject to Standard No. 4.

3.7 South Carolina Regulation 62.5, Standard No. 5.1 (State LAER)

The project is not subject to the South Carolina Lowest Achievable Emission Rate (LAER) regulation because VOC emissions increase will not exceed 100 tons since the baseline date.

South Carolina Lowest Achievable Emission Rate (LAER) Analysis

Date	Activity	Change in Emissions	Net Change in Emissions
1978	Baseline	n/a	0
1979 - 1982	No Changes	0	0
1983	No. 1 Recovery Furnace Converted to Power Boiler and New No. 3 Recovery Furnace	15	15
1984	TRS System	-41	-26
1985	No. 2 Recovery Furnace Converted to NDCE	-15	-41
	No. 10 Digester (vents to Combination Boilers)	0	-41
1986	Groundwood & Old TMP Replaced by New TMP and No. 2 Paper Machine	-80	-121
1987	No Changes	0	-121
1988	No. 1 Holding Basin Pump No. 1	3	-118
1989 - 1994	No Changes	0	-118
1995	No. 1 Lime Kiln Replaced by No. 2 Lime Kiln	1	-117
1996	No Changes	0	-117
1997	Chlorine Dioxide Plant Modifications	0	-117
1998	No Changes	0	-117
1999	Condensate Collection Tank	0	-117
	Pulp Dryer Booster Oven	7	-110
	No. 1 Holding Basin Pump No. 2	4	-106
2000	Air Make-up Units	2	-104
	LVHC System Replacement and Condensate Steam Stripper	-404	-508
2001	Kraft Mill Replaced by New Fiberline and No. 3 Paper Machine Conversion	7	-501
	Aerated Stabilization Basin Pumps	4	-497
	Tertiary Treatment Plant Pumps	4	-493
2002	New Wet-End Starch System	1	-492
2003	No Changes	0	-492
2004	No. 3 Recovery Furnace	1	-491
	TMP Bleaching System	12	-479
2005	New Fiberline Optimization	25	-454
	White Liquor Storage Tank	17	-437
2006	Polyvinyl Alcohol Storage Tanks	37.5	-400
2007	ClO2 Plant Filtrate Separation and Recovery System	0.44	-399
2010	Lime Kiln Optimization	0.8	-398
2011	Kraft Mill Optimization	14.7	-384

3.8 South Carolina Regulation 62.5, Standard No. 5.2 (Control of Oxides of Nitrogen)

Standard No. 5.2 does not apply because the project does not involve modifications to any sources of NO_X emissions.

3.9 South Carolina Regulation 62.5, Standard No. 7 (Prevention of Significant Deterioration)

The changes in emissions from the facility as a result of the proposed project were compared to the significant emission thresholds to determine which pollutants would require permitting under the Prevention of Significant Deterioration (PSD) program. The net emission changes were evaluated on a baseline actual-to-projected actual basis for the following sources:

- Kraft mill pulping system (modified source)
- Kraft mill evaporator system (modified source)
- Kraft mill bleaching system (modified source)
- Pulp dryer (affected source)

AbiBow is considered a major stationary source under New Source Review (NSR) since it emits or has the potential to emit 100 tons per year or more of a regulated NSR pollutant as defined in SC Reg. 61-62.5, Standard No. 7. The Catawba Mill is located in the Charlotte-Gastonia-Rock Hill 8-hour ozone nonattainment area, and is also subject to nonattainment NSR permitting requirements in SC Reg. 61-62.5, Standard No. 7.1 for the pollutants NO_X and VOC. The proposed project is not considered major modification if it will not cause a "significant emissions increase" of a regulated pollutant as defined in Standards No. 7 and No. 7.1.

The emission increases for the proposed project were calculated based on the actual-to-projected-actual applicability test outlined in 61-62.5, Standard No. 7(a)(2)(c). In this test, a significant emissions increase is projected to occur if the sum of the difference between the projected actual emissions and the baseline actual emissions for each existing emissions unit equals or exceeds the significant amount for that pollutant. As allowed under the regulations, the emissions that the source could have accommodated prior to the proposed changes were excluded from the significant emission increase calculation.

The following formulae may be used for calculating the significant emission increase:

$$SEI = PAE - BAE - (CHAE - BAE)$$

where: SEI = significant emission increase
PAE = projected actual emissions
BAE = baseline actual emissions

CHAE = could have accommodated emissions

The projected actual emissions determined in accordance with Regulation 61-62.5, Standard No. 7(b)(41)(i) and (ii)(a) should consider all relevant information, including "the company's own representations", "the company's filings with the State and Federal regulatory authorities", and "compliance plans approved under the State Implementation Plan". The projected actual emissions for the kraft fiberline and bleaching system were established as part of PSD construction permit 2440-0005-DA, and therefore are consistent with the regulatory requirement. The future production projections remain unchanged as a result of the proposed project.

The baseline actual emissions are based on the highest average production for the modified emission units during a consecutive 24-month period during the previous ten years as described in SC Regulation 61-62.5, Standard No. 7(b)(4)(ii).

The emissions that the modified emission units "could have accommodated" are excluded from the project actual emissions, as allowed by SC Regulation 61-62.5, Standard No. 7(b)(41)(ii)(c). Since this project increases the pulp yield using the same amounts of raw materials (wood fiber and cooking chemicals), the "could have accommodated" emissions are based on the highest month production during the 24-month baseline period. This approach is consistent with the methodology used in PSD construction permit 2440-0005-DA, as well as a recent Region 4 policy memorandum issued March 18, 2010.

The PSD applicability for greenhouse gases (GHG) in South Carolina is based on the EPA Tailoring Rule. The South Carolina General Assembly granted SCDHEC the authority to implement the EPA Tailoring Rule in the Fall of 2010. The Tailoring Rule contains a two-part applicability test in which both parts must be satisfied for PSD to apply. In part one, the project increases of carbon dioxide (CO_2), methane (NH_4), and nitrous oxide (N_2O) are each compared to a significant increase threshold of zero. In part two, the aggregate CO_2 equivalent emissions are compared to a significant increase threshold of 75,000 tons.

Based on emission calculations summarized in Appendix A, sulfur dioxide (SO_2) will be subject to Prevention of Significant Deterioration (PSD) permitting requirements.

Table 3.1
New Source Review Applicability

Emission Unit	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	TRS	CO_2e*
Kraft Mill Pulping System	0.0	0.0	110.1	0.0	12.6	15.5	1.4	1,789
Kraft Mill Evaporator System	0.0	0.0	309.6	0.0	0.0	2.7	6.0	192
Kraft Mill Condensate System	0.0	0.0	1,170.5	200.8	20.3	58.6	12.8	5,944
Bleaching System	0.0	0.0	0.0	0.0	236.7	71.7	1.2	0.0
Chlorine Dioxide Plant	0.0	0.0	0.0	0.0	0.0	0.31	0.0	0.0
Pulp Dryer	0.7	0.7	0.0	0.0	0.0	46.3	1.2	0.0
Total Baseline Actual Emissions	**0.7**	**0.7**	**1,590.2**	**200.8**	**269.6**	**195.1**	**22.6**	**7,925**
Kraft Mill Pulping System	0.0	0.0	131.1	0.0	15.0	18.5	1.7	2,131
Kraft Mill Evaporator System	0.0	0.0	368.7	0.0	0.0	3.3	7.1	229
Kraft Mill Condensate System	0.0	0.0	1,393.9	239.1	24.2	69.7	15.3	7,078
Bleaching System	0.0	0.0	0.0	0.0	284.9	86.3	1.4	0.0
Chlorine Dioxide Plant	0.0	0.0	0.0	0.0	0.0	0.44	0.0	0.0
Pulp Dryer	0.9	0.9	0.0	0.0	0.0	56.3	1.5	0.0
Total Projected Actual Emissions	**0.9**	**0.9**	**1,893.7**	**239.1**	**324.1**	**234.5**	**27.0**	**9,438**
Kraft Mill Pulping System	0.0	0.0	122.4	0.0	14.0	17.3	1.6	1,991
Kraft Mill Evaporator System	0.0	0.0	344.4	0.0	0.0	3.0	6.6	214
Kraft Mill Condensate System	0.0	0.0	1,302.1	223.3	22.6	65.2	14.3	6,612
Bleaching System	0.0	0.0	0.0.	0.0	263.4	79.8	1.3	0.0
Chlorine Dioxide Plant	0.0	0.0	0.0	0.0	0.0	0.34	0.0	0.0
Pulp Dryer	0.8	0.8	0.0	0.0	0.0	54.2	1.4	0.0
Total Could Have Accommodated Emissions	**0.8**	**0.8**	**1,768.9**	**223.3**	**300.0**	**219.8**	**25.2**	**8,817**
Total for Project	**0.1**	**0.1**	**124.8**	**15.8**	**24.1**	**14.7**	**1.8**	**621**
NSR THRESHOLD	**15**	**10**	**40**	**40**	**100**	**40**	**10**	**75,000**
IS INCREASE SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**

* The project does not meet the greenhouse gas part 2 significant increase threshold for aggregate carbon dioxide equivalent emissions.

3.10 South Carolina Regulation 62.5, Standard No. 7.1 (Non-Attainment)

The AbiBow facility is located in the Charlotte/Gastonia/Rock Hill 8-hour Ozone non-attainment area. The changes in NO_x and VOC emissions from the facility as a result of the proposed project were compared to the significant emission thresholds to determine which pollutants would require permitting under the nonattainment new source review program. The project will not increase NO_x or VOC emissions more than the significant emission rates in Standard No. 7.1; therefore, the project will not be subject to non-attainment new source review for ozone.

3.11 South Carolina Regulation 62.5, Standard No. 8 (Air Toxics)

The project will not increase the maximum emission rate of any toxic air pollutant over previous compliance demonstrations with Standard No. 8.

3.12 South Carolina Regulation 62.70 (Title V)

This project will not increase the projected actual emissions above the levels already permitted in Title V Operating Permit 2440-0005. Furthermore, no changes to the currently permitted emission limits or monitoring, recordkeeping, and reporting requirements are anticipated. AbiBow will submit revised Title V permit application forms for these sources within one year of startup of the modified equipment. The revised Title V application will address monitoring, recordkeeping, and reporting requirements contained in the pulp and paper MACT standards.

4.0 Emissions Estimates

4.1 Kraft Mill Emissions

The emissions from the kraft pulp mill were estimated using industry emission factors from the National Council for Air and Stream Improvement (NCASI). The emission factors were previously approved by SCDHEC under construction permit DA. The only modification to these emission factors is the accounting for sulfur capture in the combination boilers. Due to the alkalinity of wood ash, the combination boilers will capture approximately 32.5% of the sulfur in the kraft mill non-condensable gases (NCG's) based on information from NCASI. The emission calculations for the pulping system are presented in Appendix C along with the expected sulfur capture in the combination boilers.

4.2 Kraft Pulp Bleaching System and Chlorine Dioxide Plant

The emissions from the kraft pulp bleaching system and chlorine dioxide plant were estimated using industry emission factors from the National Council for Air and Stream Improvement (NCASI). The emission factors were previously approved by SCDHEC under construction permit DA. The emission calculations for the bleaching system and chlorine dioxide plant are presented in Appendix E.

4.3 Kraft Pulp Bleaching System

The emissions from the kraft pulp bleaching system were estimated using industry emission factors from the National Council for Air and Stream Improvement (NCASI). The emission factors were previously approved by SCDHEC under construction permit DA. The emission calculations for the bleaching system are presented in Appendix F.

4.5 Market Pulp Production

The emissions from the kraft pulp mill were estimated using industry emission factors from the National Council for Air and Stream Improvement (NCASI). The emission factors were previously approved by SCDHEC under construction permit DA. The emission calculations for the pulp dryer are presented in Appendix G.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

New Source Review (NSR) regulations [South Carolina Regulation 62.5 Standard No. 7] requires that Best Available Control Technology (BACT) be applied to minimize the emissions of compounds from a new major source or a major modification of an existing major source in attainment and non-attainment areas, respectively. This section presents the BACT evaluation for SO_2. No other pollutants exceed the NSR significance levels as a result of the proposed project.

The kraft mill TRS gases are collected in the LVHC and HVLC systems and combusted in the combination boilers. These gases are required by federal regulations (MACT and NSPS) to be collected in the LVHC and HVLC systems, and although the primary purpose of the combination boilers is to produce steam for mill operations, the boilers also combust the LVHC and HVLC gases from the kraft mill.

Section 5.1 presents an overview of the top-down BACT approach used in this application, and the BACT analyses for SO_2 from the kraft mill pulping and evaporator system modifications is presented in Section 5.2.

5.1 Top-Down BACT Approach

BACT is defined in the Clean Air Act as *an emissions limit based on the maximum degree of emissions reduction for each pollutant...which the permitting authority determines, on a case by case basis, taking into account energy, environmental, and economic impacts and other costs, is achievable for such facility through the application of production processes and available methods, systems, and techniques....* Four key aspects of the definition are worthy of notice:

- BACT is an "emissions limit" based on a control technology - not the control technology itself; or, if technological or economic limitations on the application of measurement methodology to an emissions unit would not be feasible, a design, equipment, work practice, operation standard, or combination thereof may be prescribed.
- BACT takes into account various costs associated with implementing pollution controls: economic, environmental (air, water, or solid waste), energy, and other impacts.

- BACT includes and, in fact, focuses on "production processes" along with add-on controls.
- BACT is intended to be a case-by-case evaluation, implying individual case evaluations and decisions, not rigid, pre-set guidelines.

The top-down BACT approach starts with the most stringent (or top) technology that has been applied to the same unit at other similar emission source types and provides a basis for rejecting the technology in favor of the next most stringent technology or proposing it as BACT.

Step 1

The first step is to define the spectrum of process and/or add-on control alternatives potentially applicable to the subject emissions unit. The following categories of technologies are addressed in identifying candidate control alternatives:

- Demonstrated add-on control technologies applied to the same emissions unit at other similar source types;
- Add-on controls not demonstrated for the source category in question but transferred from other source categories with similar emission stream characteristics;
- Process controls such as combustion or alternate production processes;
- Add-on control devices serving multiple emission units in parallel; and
- Equipment or work practices, especially for fugitive or area emission sources where add-on controls are not feasible.

A review of the RACT/BACT/LAER Clearinghouse (RBLC) is the first step in this process.

Step 2

The second step in the top-down approach is to evaluate the technical feasibility of the alternatives identified in the first step and to reject those that can be demonstrated as infeasible based on an engineering evaluation or on chemical or physical principles. The following criteria are considered in determining technical feasibility: previous commercial-scale demonstrations, precedents based on permits, requirements for similar sources, and technology transfer.

Step 3

The third step is an assessment and documentation of the emissions limit achievable with each technically feasible alternative considering the specific operating constraints of the emission units undergoing review. After determining what control efficiency is achievable with each alternative, the alternatives are rank-ordered into a control hierarchy from most to least stringent.

Step 4

The fourth step is to evaluate the cost/economic, environmental, and energy impacts of the top or most stringent alternative. To reject the top alternative, it must be demonstrated that this control alternative is infeasible based on the impacts analysis results. If a control technology is determined to be technically infeasible or infeasible based on high cost effectiveness, or to cause adverse energy or environmental impacts, the control technology is rejected as BACT and the impact analysis is performed on the next most stringent control alternative. In analyzing economic cost effectiveness, the annualized control cost (in dollars per ton of emissions removed) was compared with commonly accepted values for cost effective emission controls.

Step 5

The fifth and final step in the analysis is the consideration of toxic pollutant impacts on the control alternative choice. Toxics concerns are usually important only if an adverse toxic emissions impact results from the selected alternative. As in step 4, if an adverse toxic emissions impact is determined, the alternative is rejected in favor of the next most stringent alternative.

5.2 Kraft Mill Sulfur Dioxide from TRS Combustion

The net increase in sulfur dioxide (SO_2) emissions from the proposed modification is the result of the increased throughput to the kraft mill. The non-condensable gases (NCG's) from the kraft mill are collected within the LVHC and HVLC collection system. Both collection systems are combusted in the No. 1 and No. 2 combination boilers to comply with NSPS Subpart BB.

Potential control technologies for SO_2 emissions include pre-combustion TRS controls or post-combustion add-on SO_2 control technologies. As part of the new kraft fiberline project in 2001, AbiBow determined that the installation of pre-combustion scrubbers within the HVLC system was technically infeasible due to the high flow conditions, the required pressure drop across the scrubbing system, and potential impact to the combustion controls required by NESHAP standards. AbiBow currently uses a TRS caustic scrubber on the LVHC system prior to the combination boilers to reduce TRS and SO2 emissions prior to combustion.

5.2.1.1 Demonstrated Control Technologies

AbiBow has evaluated control technologies for sulfur dioxide emissions from the kraft mill through the review of the RBLC database, the South Coast Air Quality Management District's (AQMD) BACT Guidelines, and the EPA Clean Air Technology Center's technical bulletins or fact sheets.

The RBLC contained limited SO_2 determinations for modifications to existing kraft mill systems. A summary of the BACT determinations are listed in Table 5.1. BACT determinations for new equipment or sources were excluded from further evaluation.

Table 5.1
Summary of SO_2 RBLC Determinations
Existing Mills

RBLCID	FACILITY	COUNTY	ST	RATE	UNITS	CONTRL DECSRIPTION
AL-0015	HAMMERMILL PAPER	DALLAS	AL	11.000	LB/H	NONE LISTED
AL-0018	ALABAMA RIVER PULP CO., INC		AL	0.500	SEC @ 1200 F	INCINERATION - RECOVERY BOILER
AL-0019	UNION CAMP CORP		AL	0.500	SEC @ 1200 F	INCINERATION
AL-0020	INDEPENDENT KRAFT CORP		AL	0.500	SEC @ 1200 F	INCINERATION
ME-0030	LINCOLN PULP AND PAPER CO., INC	PENOBSCOT	ME	5.000 5.000	PPM PPM @ 10% O2	COLLECTION OR INCINERATION
MN-0011	BOISE CASCADE		MN	0.120	LB/T ADUP	NONE LISTED
NC-0019.A	FEDERAL PAPER BOARD CO., INC		NC	16.2	LB/H	INCINERATE TRS IN POWER BOILER #6
SC-0015	WILLAMETTE INDUSTRIES	MARLBORO	SC	5.000	PPM, DRY BASIS	VENTED TO NCG INCINERATOR OR LIME KILN
SC-0016	UNION CAMP PULP AND PAPER MILL	RICHLAND	SC	COMPLETE COMBUSTION		INCINERATION
TX-0263	DONAHUE INDUSTRIES, INC PAPER MILL	ANGELINA	TX	9.820 43.00	LB/HR TON/YR	NONE LISTED

The selected control technologies for existing kraft mill systems include collection and incineration in recovery/power boilers.

5.2.1.2 Potential Control Technologies

Emission control technologies potentially applicable to the removal or destruction of sulfur dioxide from the post-control air stream were initially evaluated based upon technical feasibility. Technologies determined to be technically infeasible were excluded from further evaluation. Control technologies evaluated include scrubbers and flue gas desulfurization.

5.2.1.2.1 Wet Scrubbers

Scrubbers involve the use of packed columns or trays to facilitate contact between either a water or chemical solution to facilitate the preferential absorption of pollutants from the air stream to scrubbant solution for collection, treatment, and disposal. According to the EPA (EPA-452/F-03-015), absorption (scrubbing) may be used for gaseous streams containing high VOC concentrations, especially for water soluble compounds such as methanol, ethanol, isopropanol, etc. Scrubbers are more commonly employed for use in controlling low dust loadings or soluble inorganic vapors. Wet scrubbers are employed to remove SO_2 from exhaust streams with a control efficiency averaging 90 percent (EPA-452/F-03-012).

According to the EPA (EPA-452/F-03-012, EPA-452/F-03-015, and EPA-452/F-03-017), wet flue gas desulfurization (FGD) may be achieved using impingement or tray scrubbers. The spent scrubbing solution is filtered to remove the calcium sulfite/sulfate, and the solids are sent to a landfill for disposal.

Traditional wet scrubbers are designed to control air flow ranging between 1,000 and 100,000 standard cubic feet per minute. Inlet gas temperatures range from 4°C to 370°C. Exhaust flow rates from Combination Boiler No. 1 or No. 2 are more than double the traditional scrubber operating range, while the exhaust temperature shall be near the upper limit of the technology. Although SO_2 may be removed from the post-combustion stream, the cooling of the exhaust stream may result in a visible plume with a potential for equipment corrosion.

Due to the low SO_2 emissions generated from the combustion of non-combustible gases and the high volume of air flow from the combination boiler, the anticipated control efficiency for a wet scrubbing system is anticipated to achieve no more than 90 percent control.

5.2.1.2.2 Flue Gas Desulfurization (FGD) – Dry

Dry flue gas desulfurization (FGD) removes SO_2 by using a spray dryer to inject lime slurry into the flue gas. Within the flue gas stream, SO_2 and the lime slurry react to form calcium sulfite and calcium sulfate. The calcium sulfite/sulfate is then removed from the exhaust gases using an ESP or other particulate control device.

AbiBow currently employs the use of an electrostatic precipitator (ESP) to control particulate emissions from each combination boiler. Installing a dry FGD would result in the ESP collecting both fly ash from the bark combustion and calcium sulfite/sulfate from the spray dryer, requiring a larger ESP. The powerhouse at the AbiBow Catawba mill is "land locked" and has very limited space. To build a FGD system and larger ESP for each combination boiler, major demolition and construction activities would be required to create the necessary space. These include relocating the kraft mill condensate stripper, wood chip and bark storage piles, chip truck dumper, chip conveyors and transfer stations, utility pipe bridges, and several roads. Based upon the major demolition or construction requirements to employ FGD, AbiBow has determined that the dry FGD process is technically infeasible.

5.2.1.3 Control Technology Cost Estimates

Upon review of the RBLC and the NEET databases, AbiBow has determined the sole technology that is technically feasible for SO_2 control is a wet scrubber system following the No.1 and No. 2 combination boilers. The existing process configuration minimizes SO_2 emissions through the reduction of TRS from the LVHC system gases prior to combustion. The cost-effectiveness of post-combustion controls was determined by dividing the incremental annual cost difference by the theoretical SO_2 emissions reduction in tons per year for the control option.

The capital costs for the installation of a wet scrubbing system were determined based upon vendor supplied information. Formulas as provided in Section 5.2 of the EPA Air Pollution Control Cost Manual, Sixth Edition (APCCM) do not account for the high volumetric air flow rate and are not applicable to equipment costs. Basic equipment costs for a wet scrubber system are based on the air flow and pollutant loading. The purchased equipment cost includes the equipment costs plus additional costs associated with instruments and controls, taxes, and freight. Additional costs, not specifically included in vendor information, have been estimated using formulas within the APCCM.

The total capital investment for the wet scrubber system is estimated based on a series of factors applied to the purchased equipment cost to obtain direct and indirect installation costs. These costs are then added to the purchased equipment cost to determine the total capital investment.

Direct annual costs include operating and supervisory labor, operating materials, replacement parts, maintenance labor and materials, electricity, and waste disposal. Typical labor rates and material cost determinations have been determined based on APCCM assumptions. APCCM states that typical operating labor requirements are one-half hour per shift for each scrubber system. It is assumed that the operators will work 548 hours per year, based on 8,760 operating hours per year and eight hours per shift. (8,760 hrs/yr ÷ 8 hrs/shift x 0.5 hr/shift). Based on APCCM, the supervisory labor cost is assumed to be 15 percent of operating labor cost. Maintenance labor is estimated to be 548 hours per year, based on 8,760 operating hours per year and eight hours per shift. (8,760 hrs/yr ÷ 8 hrs/shift x 0.5 hr/shift).

The electricity price of $0.046 per kilowatt-hour was used in the electricity cost determinations. The annual cost of electricity is based on the inlet stream flow rate, pressure drop, and pump/blower size. This cost was determined using the formula found in the APCCM. The scrubber system will also have water, scrubbing solution, and wastewater treatment costs. These costs have been determined using the formulas found in the APCCM.

Indirect annual costs have been determined for the scrubber system. These indirect costs include overhead, taxes, insurance, administrative costs, and capital recovery. Overhead costs are assumed to be 60 percent of operating and maintenance costs, as presented by APCCM. Taxes, insurance, and administrative costs are assumed to be four percent of the total capital investment. Capital recovery is determined using a factor based on an equipment life of 15 years and an interest rate of seven percent. This factor is then multiplied by the total capital investment.

This cost effectiveness of installing a SO_2 scrubber is based upon the annualized costs divided by the emissions reduction provided by the control technology. The estimated equipment costs for the scrubbing system is \$4,000,000 per unit which includes the control system design, stack design, and erection costs. Items not included within the estimate include electrical wiring, control systems, reagent storage/feed systems, utility connections, site preparations, footings/supports, and ducting to the scrubber system.

In order to achieve continuous control of SO_2 emissions, the cost estimate must include the capital cost for two scrubbers, since emissions are routed to either the No.1 or No. 2 combination boilers. However, the operating costs are based on only one scrubber being in use at any time. Using APCCM formulas, the total capital investment for two scrubber systems with supporting equipment has been estimated at \$15,400,000. When accounting for annual costs and capital recovery factors, the total annualized cost for the SO_2 controls is \$4,158,462.

ANNUALIZED COST ANALYSIS

ABIBOW US INC.
CATAWBA, SOUTH CAROLINA
KRAFT MILL TRS INCINERATION
SO_2 SCRUBBER

Cost Item	Computation Method					Cost (Dollars) SCRUBBER
Total Basic Equipment (A)	Vendor Information per unit (2 total)					$4,000,000
Purchased Equipment Cost (B)	Subtotal of above					$8,000,000
Direct Installation Costs (DIC)	Air Pollution Cost Control Manual - 6th Edition					$4,480,000
Modifications to ductwork	Air Pollution Cost Control Manual - 6th Edition					$80,000
Total Direct Costs (DC)	Subtotal of above					$12,560,000
Indirect Costs (IC)	Air Pollution Cost Control Manual - 6th Edition					$2,800,000
TOTAL CAPITAL INVESTMENT (E)	VENDOR INFORMATION					**$15,360,000**
Direct Operating Costs						
Operator	20.00	$/hr	x	548	hr/yr	$10,950
Supervisory Labor	15% of operator labor cost					$1,643
Operating Materials	As Required					
Maintenance (general)						
Labor	20.00	$/hr	x	548	hr/yr	$10,950
Materials	100% of maintenance labor cost					$10,950
Replacement Parts	none (3)					$0
Utilities	Vendor Estimates					
Electricity	0.05	$/kWh	x	2,668,464	kWh/yr	$ 122,749
Fuel Oil		$/gal	x		gal/yr	$ -
Gas	0.00	$/1000 ft^3	x		1000 ft^3/y	$ -
Water	0.20	$/1000 gal	x	64,411	1000 gal/yr	$ 12,882
Steam	4.65	$/1000 lb	x		1000 lb/yr	$ -
Caustic	300.00	$/2000 lb	x	2,803	1000 lb/yr	$ 840,960
Waste Disposal		$/ton	x		ton/yr	$ -
Wastewater Treatment	3.8	$/1000 gal	x	129,696	1000 gal/yr	$ 492,845
TOTAL DIRECT COSTS (A)	Subtotal of above					**$1,503,929**

Cost Item	Computation Method					Cost (Dollars) SCRUBBER
Indirect Operating Costs						
Overhead	60% of O/M labor costs (a+b)					$20,696
Property Tax	1% of capital costs (G)					$153,600
Insurance	1% of capital costs (G)					$153,600
Administration	2% of capital costs (G)					$307,200
Capital Recovery	CRF = i (1+ i) ^ n / ((1+i)^ n-1) ; i= interest rate , n= years					0.1315
	(10% for 15 yr) x (capital costs + pulp production losses)					$2,019,437
TOTAL FIXED COSTS (B)	Subtotal of above					**$2,654,533**
TOTAL CREDITS (minus C)						
Product Recovery	0.00	$/ton	x	0	tons/yr	
Heat Recovery (4)	0.00	$/10^6 Btu	x	0	10^6/Btu/yr	
TOTAL ANNUALIZED COSTS (D)	**(A+B)**					**$4,158,462**

Based upon the formation of 385.2 tons per year of SO_2 from the modified kraft pulping and evaporator systems and a control efficiency of 90 percent, the cost effectiveness of the control technology is $11,994 per ton of pollutant removed, which is not cost effective.

The control technology will also generate large volumes of acidic wastewater for treatment within the existing system and may require supplemental heating of the exhaust gases to prevent the formation of a visible plume.

EVALUATION OF CONTROL COST IMPACTS
KRAFT MILL TRS INCINERATION
ABIBOW US INC.
CATAWBA, SOUTH CAROLINA

Control System	SO_2 Loading (tpy)	SO_2 Outlet (tpy)	Percent Reduction	SO_2 Emissions Reduction (tpy)	Total Annualized Cost	
					($/yr)	($/ton)
SO_2 Scrubber (90%)	385.2	38.5	90.00%	346.7	$ 4,158,462	$ 11,994

5.2.1.4 Selection of BACT

AbiBow has concluded that wet scrubbers are not a cost effective control methodology, and their use would result in increased wastewater treatment considerations and corrosion concerns. Due to the high operating temperatures, the water and caustic soda usage may increase significantly due to evaporation. Furthermore, the addition of a wet scrubber may impact boiler efficiency or controls.

Therefore, BACT for SO_2 emissions resulting from combustion of kraft mill TRS emissions in the No. 1 and No. 2 combination boilers to comply with NSPS subpart BB is continued use of the LVHC collection system TRS scrubber.

6.0 Air Quality Impact Analysis

Air dispersion modeling analyses for Class II areas around the facility will be prepared and submitted to DHEC under separate cover, following review and agreement on an air dispersion modeling protocol. Similarly, air dispersion modeling for appropriate PSD Class I areas will be discussed with the appropriate Federal Land Manager(s) and submitted under separate cover. DHEC will be provided with copies of PSD Class I area modeling and correspondence with the FLM(s).

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7.0 Additional Impacts Analysis

The additional impacts of the proposed modification on growth, soils and vegetation, and Class II visibility will be addressed in the air dispersion modeling analysis submitted under separate cover.

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APPENDIX A

Application Forms

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D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Expedited Review Request
Bureau of Air Quality
Construction Permit

RECEIVED

BUREAU OF AIR QUALITY

To be eligible for expedited review, the appropriate Part I and Part II Construction Permit Application Forms must be included with this sheet. Please attach this sheet to the top of the Part I form.

Facility Information	
Facility Name: AbiBow US Inc.	
Existing Air Permit Number (if applicable): TV-2440-0005	
Primary Permit Contact: Dale Herendeen	
Contact Phone No.: (803) 981 - 8009	Alternate Phone No.:
Contact E-mail Address: dale.herendeen@abitibibowater.com	
Date Submitted: 03/18/2011	

Applying for which type of permit?

Check One	Permit Type	Fee*
☐	Minor Source Construction Permit	$3,000
☐	Synthetic Minor Construction Permit	$4,000
☐	Prevention of Significant Deterioration (PSD) not impacting a Class I Area (no Class I modeling required)	$20,000
☒	Prevention of Significant Deterioration (PSD) impacting a Class I Area (Class I modeling required)	$25,000
	General Permit Program	
☐	Minor Source Construction Permit – Concrete Batch	$1,500
☐	Minor Source Construction Permit – Hot Mix Asphalt Plant	$2,000
☐	Synthetic Minor Construction Permit – Concrete Batch	$3,000
☐	Synthetic Minor Construction Permit – Hot Mix Asphalt Plant	$3,500

*Do not send fee payment with this form. If chosen for expedited review, you will be notified by phone for verbal acceptance into the program. Fees must be paid via check within five (5) business days of acceptance.

If the Department is unable to contact me, please contact Will Hinson at (803) 981 8759.

I have read the Expedited Review Program Standard Operating Procedures and accept all of the terms and conditions within. I understand that it is my responsibility to ensure an application of the highest quality is submitted in a timely manner, and to address any requests for additional information by the deadline specified. I understand that submittal of this request form is not a guarantee that expedited review will be granted.

Dale Herendeen
Signature of Primary Permit Contact**

3/18/11
Date

Dale Herendeen
Printed Name of Primary Permit Contact**

Environmental Manager
Title/Position

**The permit is issued to the primary contact.

DHEC RECEIVED

BUREAU OF AIR QUALITY

Bureau of Air Quality
Construction Permit Application
Part I

Please Refer to Instructions Before Completing This Form

FACILITY INFORMATION		
1. Facility Name: AbiBow US Inc.	**2. Existing Air Permit Number (if applicable):** 2440 - 0005	
Federal Identification No. :	Are you a small business? ☐ Y ☐ N	Primary SIC or NAICS Code: 2611
3. Physical Address: 5300 Cureton Ferry Road		
City: Catawba	County York	Zip Code: 29704
4. Mailing Address (if different): PO Box 7		
City: Catawba	State: SC	Zip Code: 29704
5. Facility/Operator Contact: Mr. Dale Herendeen	Are you the primary permit contact? ☑ Yes ☐ No	
Mailing Address (if different): same		
City:	State:	Zip Code:
Phone No. (803) 981 - 8009	Fax No. ( ) -	E-mail Address: dale.herendeen@abitibibowater.com
COMPANY INFORMATION		
6. Company Name: Same		
Mailing Address (if different):		
City:	State:	Zip Code:
7. Owner/Agent Contact:	Are you the primary permit contact? ☐ Yes ☐ No	
Mailing Address (if different):		
City:	State:	Zip Code:
Phone No. ( ) -	Fax No. ( ) -	E-mail Address:
CORPORATE/CONSULTANT – ENVIRONMENTAL CONTACT INFORMATION		
8. Name: Steven Moore	Firm (if applicable): URS Corporation	
Mailing Address: 11 Brendan Way	Are you the primary permit contact? ☑ Yes ☐ No	
City: Greenville	State: SC	Zip Code: 29615
Phone No. (864) 527 - 4734	Fax No. (864) 609 - 9069	E-mail Address: steven_moore@urscorp.com
FACILITY OPERATING PERMIT STATUS		
9. Facility Air Operating Permit Status: ☐ State Minor ☐ General Conditional Major ☐ Conditional Major ☑ Title V		
Will this project result in a change in the Facility Air Operating Permit Status? ☐ Yes ☑ No If yes, status after project completion:		
10. NSR Status Before Project: ☐ Minor Source ☑ PSD Major Source ☑ NSR Major Source (Non-Attainment Area)		
Will this project result in a change in the Facility NSR Status? ☐ Yes ☑ No If yes, status after project completion:		
PURPOSE OF APPLICATION		
11. Brief Narrative of Project: Modifications to the kraft mill to increase pulp yield.		
12. Permit Application Type:	☐ New Facility ☐ New Source at Existing Facility ☐ Unpermitted Existing Source ☑ Modify Existing Source ☐ Permit Revision Permit No. (i.e.,CA,CB): DA	Date Issued: 3/16/2006
Does this application contain confidential data? ☐ Yes ☑ No If yes, mark all confidential material appropriately.		
Are you requesting this application be eligible for expedited review pilot program? ☑ Yes ☐ No		
SIGNATURES		
I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.		
13. Owner or Operator Signature	**Title/Position**	**Date**
(signature)	General Manager	3-17-11
I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this application as it pertains to DHEC Air Pollution Regulation 61-62.		
14. Professional Engineer Signature	**SC License/Registration No.**	**Date**
(signature)	18074	3-17-2011

No. 18074

South Carolina Department of Health and Environmental Control

Bureau of Air Quality
Construction Permit Application
Part I
Page 2 of 3

Please Refer to Instructions Before Completing This Form

EMISSIONS SUMMARY AT MAXIMUM DESIGN CAPACITY				
Pollutant	15. Prior to Construction/Modification		16. After Construction/Modification	
	Uncontrolled (tons/year)	Controlled (tons/year)	Uncontrolled (tons/year)	Controlled (tons/year)
Particulate Matter (PM)	361,900	3,619	361,900	3,619
Particulate Matter < 10 Micron (PM_{10})	264,000	2,640	264,000	2,640
Particulate Matter < 2.5 Micron ($PM_{2.5}$)	220,300	2,203	220,300	2,203
Sulfur Dioxide (SO_2)	27,148	27,148	27,148	27,148
Carbon Monoxide (CO)	4,316	4,316	4,316	4,316
Nitrogen Oxides (NO_X)	3,667	3,667	3,667	3,667
Volatile Organic Compounds (VOCs)	76,250	1,525	76,250	1,525
Hazardous Air Pollutant – Single Greatest	39,400	788	39,400	788
Hazardous Air Pollutants – Total	53,900	1,078	53,900	1,078

PROJECT REGULATORY APPLICABILITY REVIEW				
Regulation	Applicable		General Reason Indicator(s)	Comments
	Yes	No		
17. South Carolina Regulation 61-62 - Air Pollution Control Regulations and Standards (PROJECT ONLY)				
Standard 1: Fuel Burning Operations	☐	☑	C	
Standard 2: Ambient Air Quality Standards	☑	☐	L	AAQS modeling required for new stds
Standard 3: Waste Combustion/Reduction	☐	☑	K	
Standard 3.1: HMI Waste Incinerators	☐	☑	K	
Standard 4: Emissions from Process Industries	☑	☐	L	No changes to current permit requirement
Standard 5: Volatile Organic Compounds	☐	☑	B	
Standard 5.1: BACT/LAER For VOCs	☐	☑	H	Project not subject to 5.1 (SCLEAR)
Standard 5.2: Control of Oxides of Nitrogen	☐	☑	C	Project not subject to 5.2
Standard 7: Prevention of Significant Deterioration	☑	☐	L	Project emissions subject to 7 for SO2
Standard 7(II): Minor Source Increment Analysis	☑	☐	L	Minor increases in NOx & PM10
Standard 7.1: Standards for Non Attainment Areas	☐	☑	H	Project emissions not subject to 7.1
Standard 8: Toxic Air Pollutants	☐	☑	H	Project exempt from 8 (MACT Source)
Regulation 61-62.6: Control of Fugitive Particulate Matter	☐	☑	B	
Regulation 61-62.63: National Emission Standards For Hazardous Air Pollutants (NESHAP) For Source Categories	☑	☐	L	No changes to current permit requirement
Regulation 61-62.68: Chemical Accident Prevention	☐	☑	B	
Regulation 61-62.72: Acid Rain	☐	☑	B	
Regulation 61-62.96: Nitrogen Oxides (NO_X) Budget Trading Program	☐	☑	B	
Regulation 61-62.99: Nitrogen Oxides (NO_X) Budget Program Requirements for Stationary Sources Not In the Trading Program	☐	☑	B	
Other	☐	☐		
18. Federal Regulations (PROJECT ONLY)				
NSPS (Part 60) Subpart(s)	☑	☐	L	No changes to current permit requirement
NESHAP (Part 61) Subpart(s)	☐	☑	B	
MACT (Part 63) Subpart(s)	☑	☐	L	No changes to current permit requirement
Compliance Assurance Monitoring (CAM) (Part 64)	☑	☐	L	No changes to current permit requirement
Other	☐	☐		

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Bureau of Air Quality
Construction Permit Application
Part I

Please Refer to Instructions Before Completing This Form

19. PART II FORMS – Indicate the number of applicable Part II Form(s) attached	
Fuel Burning Source Construction Permit Applications (Part IIA)	0
Process Source Construction Permit Applications (Part IIB)	3
Incinerator Applications (Part IIC)	0
Asphalt Plant Applications (Part IID)	0
Dry Cleaner Applications (Part IIE)	0
Concrete Batch Plant Permit Applications (Part IIF)	0
Storage Vessel Permit Applications (Part IIG/Part IIGa)	0

20. APPLICATION CHECKLIST

The following items must be submitted in accordance with S.C. Regulation 61-62.1, Section II(C)(3) to be considered complete. Be sure to check all items included in the application.

Included	N/A	Item Description	Last Submitted	BAQ Verify (Office Use Only)
☑	☐	A. A description of the facility's proposed new or altered processes, including the physical and chemical properties and feed rate of the materials used and produced (in pounds per hour), from which the facility determined potential emissions		☐
☐	☑	B. Scaled plot plan of the facility clearly showing property boundaries, stack and building locations, and indicating true north	8/26/2005	☐
☑	☐	C. Detailed narrative description of the project including the full scope of the project (each source installed or altered, associated control equipment, how the project affects other sources and their emissions, flow diagram/schematic of the process including all input and output streams)		☐
☑	☐	D. Project Total Emissions (Uncontrolled potential and Controlled). Attach all calculations including equations, emission factors, assumptions, and references used to estimate emissions		☐
☑	☐	E. Regulatory applicability determination (including all emission limitations, monitoring, record keeping, reporting) associated with the new or altered source(s)		☐
☐	☑	F. Air Dispersion Modeling Questionnaire(s) for each new or altered emission point	8/26/2005	☐
☑	☐	G. Facility-Wide Air Dispersion Modeling Analysis (see Air Dispersion Modeling Guidelines for further information)		☐
☐	☑	H. Description and estimate of fugitive emissions for the project		☐
☑	☐	I. A description of all air pollution control devices or systems on the new or altered source(s), whether inherent or add-on		☐
☐	☑	J. Confidential information must be properly marked and claimed under a separate cover and copies of the application suitable for public inspection must also be submitted		☐

The following items should be submitted, if applicable, in accordance with other S.C. and Federal regulations. Be sure to check all items included in the application.

Included	N/A	Item Description	Last Submitted	BAQ Verify (Office Use Only)
☐	☑	K. Any reasonably anticipated operating scenarios for the project		☐
☑	☐	L. Provide all emission data (actual emissions, baseline actual emissions, netting, etc.) needed to make applicability determinations for BACT/LAER (SC Regulation 61-62.5, Standard 5.1)		☐
☑	☐	M. If BACT/LAER is applicable above, attach an appropriate BACT/LAER analysis		☐
☑	☐	N. All emission data (actual emissions, baseline actual emissions, netting, etc.) needed to make applicability determinations for PSD and non-attainment NSR (SC Regulation 61-62.5, Standards 7 & 7.1)		☐
☑	☐	O. If PSD or NSR is applicable above, attach an appropriate BACT/LAER analysis		☐
☐	☑	P. CAM plan, if applicable	3/30/2004	☐

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South Carolina Department of Health and Environmental Control

Bureau of Air Quality
Construction Permit Application
Part IIB: Process Source

Please Refer to Instructions Before Completing This Form

1. PROCESS SOURCE INFORMATION

Unit ID: 02	Permit Number: TV-2440-0005	File Name: AbiBow Kraft Mill PSD.pdf

Check all that apply:
- ☐ Construct a new process that will not be part of an existing source
- ☑ Alter an existing source
  - ☑ Adding new equipment
  - ☐ Replacing existing equipment — Specify equipment to be replaced:
  - ☑ Other: Increasing wash water through kraft mill

Description of New or Existing Process/Equipment (including description of alteration to existing source): Modifications and installation of new oxygen reactor and auxiliary equipment and increasing shower water.

Process description (define process boundary): Kraft Pulp Mill (Equipment ID's 5210 - 5250)

Does the unit combust a waste as defined in Section 61-62.1? ☐ Yes ☑ No
If yes, which waste streams?

Is this unit equipped with a control device? ☑ Yes ☐ No (If yes, complete the information on page 3 of this form.)

2. RAW MATERIAL DATA

What is the process weight rate (ton/hour) for the entire process as defined in SC Regulation 61-62.1? NA

Material	Maximum Quantity Used (Units)
wood fiber	2,566,200 tons/yr

3. PRODUCT DATA

Products	Production at Maximum Rated Capacity (Units)
Unbleached Kraft Pulp	666,125 ADTUP/yr

4. NEW OR ALTERED PROCESS SOURCE(S)

Process/ Equipment ID	Equipment Description (Include Make/Model of Each)	Design Capacity (Units)	Normal Operating (throughput) Rate (Units)	Control Device ID	Stack/ Emission ID
5240	Oxygen Reactor No. 1b	1,825.0 ADTP/dy	1,704.9 ADTP/dy	NA	NA
5240	Oxygen Mixer with Booster Pump	1,825.0 ADTP/dy	1,704.9 ADTP/dy	NA	NA

5. NEW OR ALTERED FUEL BURNING SOURCE(S)

Process/ Equipment ID	Indirect/Direct Heating	Total Rated Heat Input (10^6 BTU/hr)	Number of Burners	Size of Each Burner (10^6 BTU/hr)	Burner Type (Solid Fuels Only)	Equipped with a Low NOx Burner?	If Yes, For Which Fuels?
						☐	
						☐	
						☐	

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South Carolina Department of Health and Environmental Control

Bureau of Air Quality
Construction Permit Application
Part IIB: Process Source

Please Refer to Instructions Before Completing This Form

Unit ID: 02	Permit Number: TV-2440-0005	File Name: AbiBow Kraft Mill PSD.pdf

6. FUEL DATA (Include All Fuels)

Process/ Equipment ID	Fuel Type and Grade	BTU Content	% Sulfur by Weight	% Ash by Weight	Consumption @ Rated Capacity (Units)

7. EMISSION RATES AT MAXIMUM RATED CAPACITY

Process/ Equipment ID	Pollutant	CAS Number	HAP, TAP, or Both	Uncontrolled (tons/year)	Controlled (tons/year)	Calculation Method
5210-5250	SO2			195	131	Engineering estimate
5210-5250	CO			15.0	15.0	Engineering estimate
5210-5250	VOC			925	18.5	Engineering estimate
5210-5250	Total HAPs			545	10.9	Engineering estimate
5210-5250	TRS			170	1.7	Engineering estimate
5210-5250	CO2e			2,131	2,131	Engineering estimate

8. OPERATING SCHEDULE INFORMATION

Hours/Day: 24	Days/Week: 7	Weeks/Year: 52	Max Hours/Year: 8,760
Seasonal Variation			
Dec. – Feb. (%): 25	Mar. – May (%): 25	June – Aug. (%): 25	Sept. – Nov. (%): 25

Attach sheets as necessary to provide any additional information.

Bureau of Air Quality
Construction Permit Application
Part IIB: Process Source

Please Refer to Instructions Before Completing This Form

9. CONTROL DEVICE INFORMATION

Primary Control Device

Control Device ID: 5260C
Stack/Exhaust ID: 2610S1/S2

Manufacturer Make and Model:
Type of Device: LVHC Caustic Scrubber

Inherent to Process: ☐ Yes ☑ No **If inherent, please explain:**

Pollutants Controlled:
☐ Particulate Matter (PM) ☐ Particulate Matter < 10 Micron (PM_{10}) ☑ Sulfur Dioxide (SO_2) ☐ HAP/TAP
☐ Carbon Monoxide (CO) ☐ Nitrogen Oxides (NOx) ☐ Volatile Organic Compounds (VOC)
☑ Other, Please list any other pollutants controlled: Total Reduced Sulfur (TRS)

Projected Capture Efficiency: 99 % **Destruction, Control, or Removal Efficiency:** 50 %

Engineering Design and Operating Characteristics:

Manufacturer's Specifications and Ratings:

Recommended Control Device Monitoring/Data Collection (include parameters): scrubbing liquid flow and pH

Recordkeeping: once daily records

Secondary Control Device

Control Device ID: 2605 or 3705
Stack/Exhaust ID: 2610S1/S2

Manufacturer Make and Model: B & W
Type of Device: Combination Boilers

Inherent to Process: ☐ Yes ☐ No **If inherent, please explain:**

Pollutants Controlled:
☐ Particulate Matter (PM) ☐ Particulate Matter < 10 Micron (PM_{10}) ☐ Sulfur Dioxide (SO_2) ☑ HAP/TAP
☐ Carbon Monoxide (CO) ☐ Nitrogen Oxides (NOx) ☑ Volatile Organic Compounds (VOC)
☑ Other, Please list any other pollutants controlled: Total Reduced Sulfur (TRS)

Projected Capture Efficiency: % **Destruction, Control, or Removal Efficiency:** %

Engineering Design and Operating Characteristics:

Manufacturer's Specifications and Ratings:

Recommended Control Device Monitoring/Data Collection (include parameters): Venting status from the HVLC and LVHC collection systems

Recordkeeping: Venting logs

Additional Control Device

Control Device ID:
Stack/Exhaust ID:

Manufacturer Make and Model:
Type of Device:

Inherent to Process: ☐ Yes ☐ No **If inherent, please explain:**

Pollutants Controlled:
☐ Particulate Matter (PM) ☐ Particulate Matter < 10 Micron (PM_{10}) ☐ Sulfur Dioxide (SO_2) ☐ HAP/TAP
☐ Carbon Monoxide (CO) ☐ Nitrogen Oxides (NOx) ☐ Volatile Organic Compounds (VOC)
☐ Other, Please list any other pollutants controlled:

Projected Capture Efficiency: % **Destruction, Control, or Removal Efficiency:** %

Engineering Design and Operating Characteristics:

Manufacturer's Specifications and Ratings:

Recommended Control Device Monitoring/Data Collection (include parameters):

Recordkeeping:

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Bureau of Air Quality
Construction Permit Application
Part IIB: Process Source

Please Refer to Instructions Before Completing This Form

1. PROCESS SOURCE INFORMATION		
Unit ID: 04	Permit Number: TV-2440-0005	File Name: AbiBow Kraft Mill PSD.pdf

Check all that apply:
- ☐ Construct a new process that will not be part of an existing source
- ☑ Alter an existing source
  - ☑ Adding new equipment
  - ☐ Replacing existing equipment — Specify equipment to be replaced:
  - ☐ Other:

Description of New or Existing Process/Equipment (including description of alteration to existing source): New filtrate separation system for chlorine dioxide plant to support bleaching additional kraft pulp yield

Process description (define process boundary): Kraft Bleaching System - Chlorine Dioxide Plant

Does the unit combust a waste as defined in Section 61-62.1? ☐ Yes ☑ No
If yes, which waste streams?

Is this unit equipped with a control device? ☑ Yes ☐ No (If yes, complete the information on page 3 of this form.)

2. RAW MATERIAL DATA

What is the process weight rate (ton/hour) for the entire process as defined in SC Regulation 61-62.1? NA

Material	Maximum Quantity Used (Units)
reactants (sodium chlorate, methanol, and sulfuric acid)	61,320 tons/yr

3. PRODUCT DATA

Products	Production at Maximum Rated Capacity (Units)
Chlorine Dioxide	14,600 tons/yr

4. NEW OR ALTERED PROCESS SOURCE(S)

Process/ Equipment ID	Equipment Description (Include Make/Model of Each)	Design Capacity (Units)	Normal Operating Throughput Rate (Units)	Control Device ID	Stack/ Exhaust ID
1790	Filtrate Separation System Surge Ta	40 T ClO2/dy	30.9 T ClO2/dy	1790C, 1790S	1790

5. NEW OR ALTERED FUEL BURNING SOURCE(S)

Process/ Equipment ID	Indirect/Direct Heating	Total Rated Heat Input (10^6 BTU/hr)	Number of Burners	Size of Each Burner (10^6 BTU/hr)	Burner Type (Solid Fuels Only)	Equipped with a Low NOx Burner?	If Yes, For Which Fuels?
						☐	
						☐	
						☐	

Bureau of Air Quality
Construction Permit Application
Part IIB: Process Source

Please Refer to Instructions Before Completing This Form

Unit ID: 04	Permit Number: TV-2440-0005	File Name: AbiBow Kraft Mill PSD.pdf

6. FUEL DATA (Include All Fuels)					
Process/ Equipment ID	Fuel Type and Grade	BTU Content	% Sulfur by Weight	% Ash by Weight	Consumption @ Rated Capacity (Units)

7. EMISSION RATES AT MAXIMUM RATED CAPACITY						
Process/ Equipment ID	Pollutant	CAS Number	HAP, TAP, or Both	[illegible]	[illegible]	Calculation Method
1790	VOC			0.4	0.4	Engineering estimate
1790	Total HAPs			0.2	0.2	Engineering estimate
1790	Chlorine Dioxide			144	0.23	Engineering estimate

8. OPERATING SCHEDULE INFORMATION			
Hours/Day: 24	Days/Week: 7	Weeks/Year: 52	Max Hours/Year: 8,760
Seasonal Variation			
Dec. – Feb. (%): 25	Mar. – May (%): 25	June – Aug. (%): 25	Sept. – Nov. (%): 25

Attach sheets as necessary to provide any additional information.

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Bureau of Air Quality
Construction Permit Application
Part IIB: Process Source

Please Refer to Instructions Before Completing This Form

9. CONTROL DEVICE INFORMATION

Primary Control Device			**Control Device ID:** 1790C **Stack/Exhaust ID:** 1790
Manufacturer Make and Model:			**Type of Device:** Scrubber
Inherent to Process: ☐ Yes ☑ No	**If inherent, please explain:**		
Pollutants Controlled:	☐ Particulate Matter (PM) ☐ Particulate Matter < 10 Micron (PM_{10}) ☐ Sulfur Dioxide (SO_2) ☐ HAP/TAP ☐ Carbon Monoxide (CO) ☐ Nitrogen Oxides (NOx) ☐ Volatile Organic Compounds (VOC) ☑ Other, Please list any other pollutants controlled: Chlorine dioxide gas (ClO_2)		
Projected Capture Efficiency: 99 %		**Destruction, Control, or Removal Efficiency:** 98 %	
Engineering Design and Operating Characteristics:			
Manufacturer's Specifications and Ratings:			
Recommended Control Device Monitoring/Data Collection (include parameters): Pressure drop and scrubbing liquid flow and pH			
Recordkeeping: Once daily records.			
Secondary Control Device			**Control Device ID:** 1790Ca **Stack/Exhaust ID:** 1790
Manufacturer Make and Mode			**Type of Device:** Scrubber
Inherent to Process: ☐ Yes ☑ No	**If inherent, please explain:**		
Pollutants Controlled:	☐ Particulate Matter (PM) ☐ Particulate Matter < 10 Micron (PM_{10}) ☐ Sulfur Dioxide (SO_2) ☐ HAP/TAP ☐ Carbon Monoxide (CO) ☐ Nitrogen Oxides (NOx) ☐ Volatile Organic Compounds (VOC) ☑ Other, Please list any other pollutants controlled: Chlorine dioxide gas (ClO_2)		
Projected Capture Efficiency: 99 %		**Destruction, Control, or Removal Efficiency:** 88-92 %	
Engineering Design and Operating Characteristics:			
Manufacturer's Specifications and Ratings: The destruction efficiency for Cl_2 is 88%; that for ClO_2 is 92%.			
Recommended Control Device Monitoring/Data Collection (include parameters): Not required.			
Recordkeeping: Not required			
Additional Control Device			**Control Device ID:** **Stack/Exhaust ID:**
Manufacturer Make and Model:			**Type of Device:**
Inherent to Process: ☐ Yes ☐ No	**If inherent, please explain:**		
Pollutants Controlled:	☐ Particulate Matter (PM) ☐ Particulate Matter < 10 Micron (PM_{10}) ☐ Sulfur Dioxide (SO_2) ☐ HAP/TAP ☐ Carbon Monoxide (CO) ☐ Nitrogen Oxides (NOx) ☐ Volatile Organic Compounds (VOC) ☐ Other, Please list any other pollutants controlled:		
Projected Capture Efficiency: %		**Destruction, Control, or Removal Efficiency:** %	
Engineering Design and Operating Characteristics:			
Manufacturer's Specifications and Ratings:			
Recommended Control Device Monitoring/Data Collection (include parameters):			
Recordkeeping:			

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South Carolina Department of Health and Environmental Control

Bureau of Air Quality
Construction Permit Application
Part IIB: Process Source

Please Refer to Instructions Before Completing This Form

1. PROCESS SOURCE INFORMATION		
Unit ID: 07	Permit Number: TV-2440-0005	File Name: AbiBow Kraft Mill PSD.pdf

Check all that apply:
- ☐ Construct a new process that will not be part of an existing source
- ☑ Alter an existing source
  - ☑ Adding new equipment
  - ☑ Replacing existing equipment — Specify equipment to be replaced: Replace No. 3 evaporator condenser
  - ☑ Other: pump upgrades with associated piping

Description of New or Existing Process/Equipment (including description of alteration to existing source): New heat exchanger for No. 1 evaporator and new NCG hotwell, coolers, and ejectors for No. 3 evaporator to increase surface area for evaporation

Process description (define process boundary): Kraft mill evaporators - Equipment ID's 2400 (No. 1 evaporator set), 2500 (No. 2 evaporator set), and 5100 (No. 3 evaporator set)

Does the unit combust a waste as defined in Section 61-62.1? ☐ Yes ☑ No
If yes, which waste streams?

Is this unit equipped with a control device? ☑ Yes ☐ No (If yes, complete the information on page 3 of this form.)

2. RAW MATERIAL DATA

What is the process weight rate (ton/hour) for the entire process as defined in SC Regulation 61-62.1? NA

Material	Maximum Quantity Used (Units)
Black Liquor Solids	1,156,685 tons/yr

3. PRODUCT DATA

Products	Production at Maximum Rated Capacity (Units)
Black Liquor Solids	1,156,685 tons/yr

4. NEW OR ALTERED PROCESS SOURCE(S)

Process/ Equipment ID	Equipment Description (Include Manufacturer & Model)	Design Capacity (Units)	Normal Operating Throughput Rate (Units)	Control Device ID	Stack/ Emission ID
2400	No. 1 Evaporator Set			2605 or 3705	2610S1/S2
5100	No. 3 Evaporator Set			2605 or 3705	2610S1/S2

5. NEW OR ALTERED FUEL BURNING SOURCE(S)

Process/ Equipment ID	Indirect/Direct Heating	Total Rated Heat Input (10^6 BTU/hr)	Number of Burners	Size of Each Burner (10^6 BTU/hr)	Burner Type (Solid Fuels Only)	Equipped with a Low NOx Burner?	If Yes, For Which Fuels?
						☐	
						☐	
						☐	

Bureau of Air Quality
Construction Permit Application
Part IIB: Process Source
Page 2 of 3
Please Refer to Instructions Before Completing This Form

Unit ID: 07	Permit Number: TV-2440-0005	File Name: AbiBow Kraft Mill PSD.pdf

6. FUEL DATA (Include All Fuels)

Process/ Equipment ID	Fuel Type and Grade	BTU Content	% Sulfur by Weight	% Ash by Weight	Consumption @ Rated Capacity (Units)

7. EMISSION RATES AT MAXIMUM RATED CAPACITY

Process/ Equipment ID	Pollutant	CAS Number	HAP, TAP or Both	Uncontrolled (tons/year)	Controlled (tons/year)	Calculation Method
2400/2500/5100	SO_2			1,092	368.7	Engineering estimate
2400/2500/5100	VOC			165	3.3	Engineering estimate
2400/2500/5100	Total HAPs			165	3.3	Engineering estimate
2400/2500/5100	TRS			710	7.1	Engineering estimate
2400/2500/5100	CO_2e			229	229	Engineering estimate

8. OPERATING SCHEDULE INFORMATION

Hours/Day: 24	Days/Week: 7	Weeks/Year: 52	Max Hours/Year: 8,760
Seasonal Variation			
Dec. – Feb. (%): 25	Mar. – May (%): 25	June – Aug. (%): 25	Sept. – Nov. (%): 25

Attach sheets as necessary to provide any additional information.

Bureau of Air Quality
Construction Permit Application
Part IIB: Process Source

Please Refer to Instructions Before Completing This Form

9. CONTROL DEVICE INFORMATION

[redacted]

Control Device ID: 5260C
Stack/Exhaust ID: 2610S1/S2

Manufacturer Make and Model:
Type of Device: LVHC Caustic Scrubber

Inherent to Process: ☐ Yes ☑ No **If inherent, please explain:**

Pollutants Controlled: ☐ Particulate Matter (PM) ☐ Particulate Matter < 10 Micron (PM_{10}) ☑ Sulfur Dioxide (SO_2) ☐ HAP/TAP ☐ Carbon Monoxide (CO) ☐ Nitrogen Oxides (NOx) ☐ Volatile Organic Compounds (VOC) ☑ Other, Please list any other pollutants controlled: Total Reduced Sulfur (TRS)

Projected Capture Efficiency: 99 % **Destruction, Control, or Removal Efficiency:** 50 %

Engineering Design and Operating Characteristics:

Manufacturer's Specifications and Ratings:

Recommended Control Device Monitoring/Data Collection (include parameters): scrubbing liquid flow and pH

Recordkeeping: once daily records

[redacted]

Control Device ID: 2605 or 3705
Stack/Exhaust ID: 2610S1/S2

Manufacturer Make and Model: B & W Combination Boilers
Type of Device: Combination Boilers

Inherent to Process: ☐ Yes ☑ No **If inherent, please explain:**

Pollutants Controlled: ☐ Particulate Matter (PM) ☐ Particulate Matter < 10 Micron (PM_{10}) ☐ Sulfur Dioxide (SO_2) ☑ HAP/TAP ☐ Carbon Monoxide (CO) ☐ Nitrogen Oxides (NOx) ☑ Volatile Organic Compounds (VOC) ☑ Other, Please list any other pollutants controlled: TRS

Projected Capture Efficiency: 99 % **Destruction, Control, or Removal Efficiency:** 99.9 %

Engineering Design and Operating Characteristics:

Manufacturer's Specifications and Ratings:

Recommended Control Device Monitoring/Data Collection (include parameters): Venting status from the HVLC and LVHC collection systems

Recordkeeping: Venting logs

[redacted]

Control Device ID:
Stack/Exhaust ID:

Manufacturer Make and Model:
Type of Device:

Inherent to Process: ☐ Yes ☐ No **If inherent, please explain:**

Pollutants Controlled: ☐ Particulate Matter (PM) ☐ Particulate Matter < 10 Micron (PM_{10}) ☐ Sulfur Dioxide (SO_2) ☐ HAP/TAP ☐ Carbon Monoxide (CO) ☐ Nitrogen Oxides (NOx) ☐ Volatile Organic Compounds (VOC) ☐ Other, Please list any other pollutants controlled:

Projected Capture Efficiency: % **Destruction, Control, or Removal Efficiency:** %

Engineering Design and Operating Characteristics:

Manufacturer's Specifications and Ratings:

Recommended Control Device Monitoring/Data Collection (include parameters):

Recordkeeping:

APPENDIX B

Process Flow Diagrams

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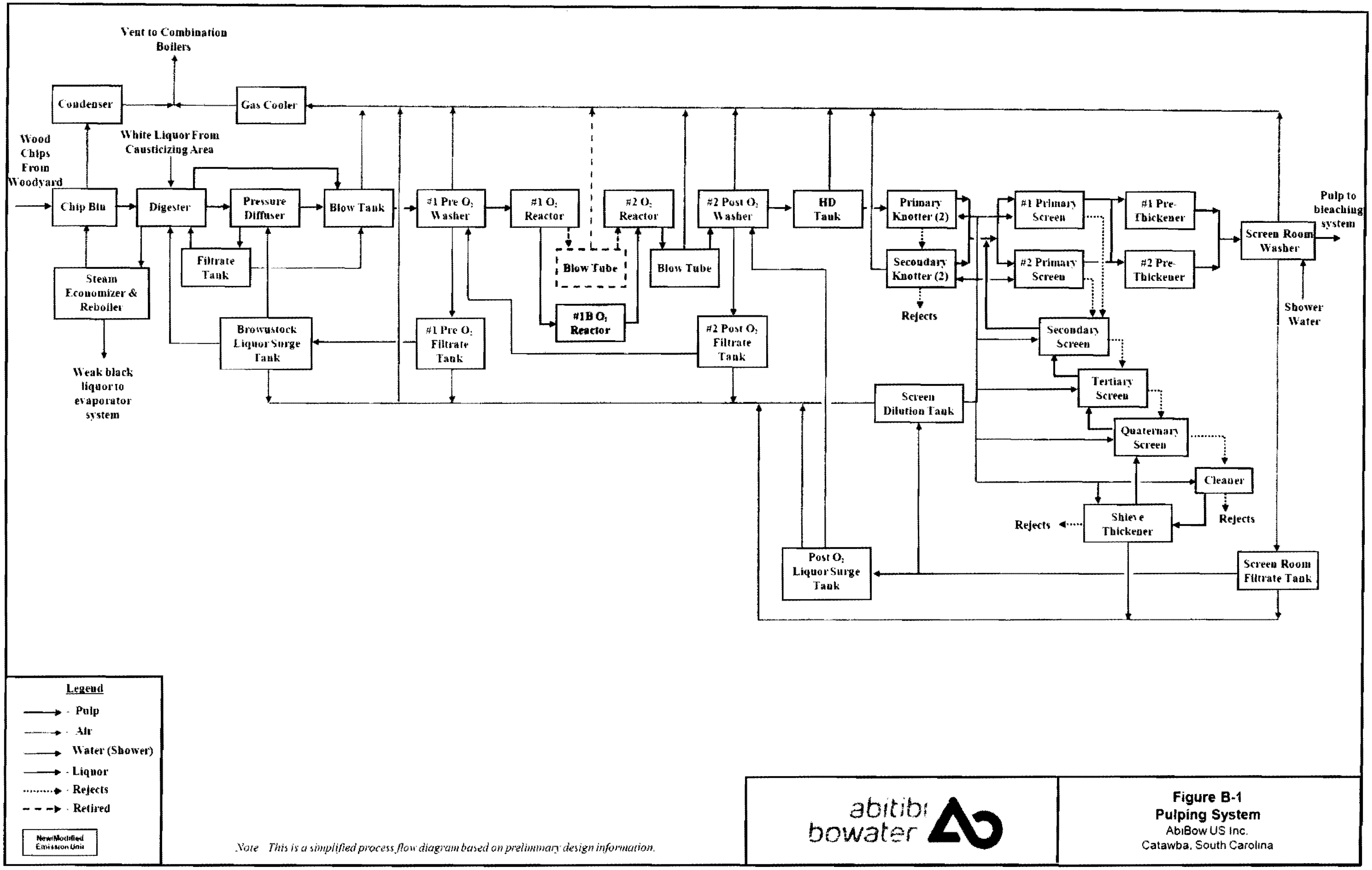

Note This is a simplified process flow diagram based on preliminary design information.

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Figure B-1
Pulping System
AbiBow US Inc.
Catawba, South Carolina

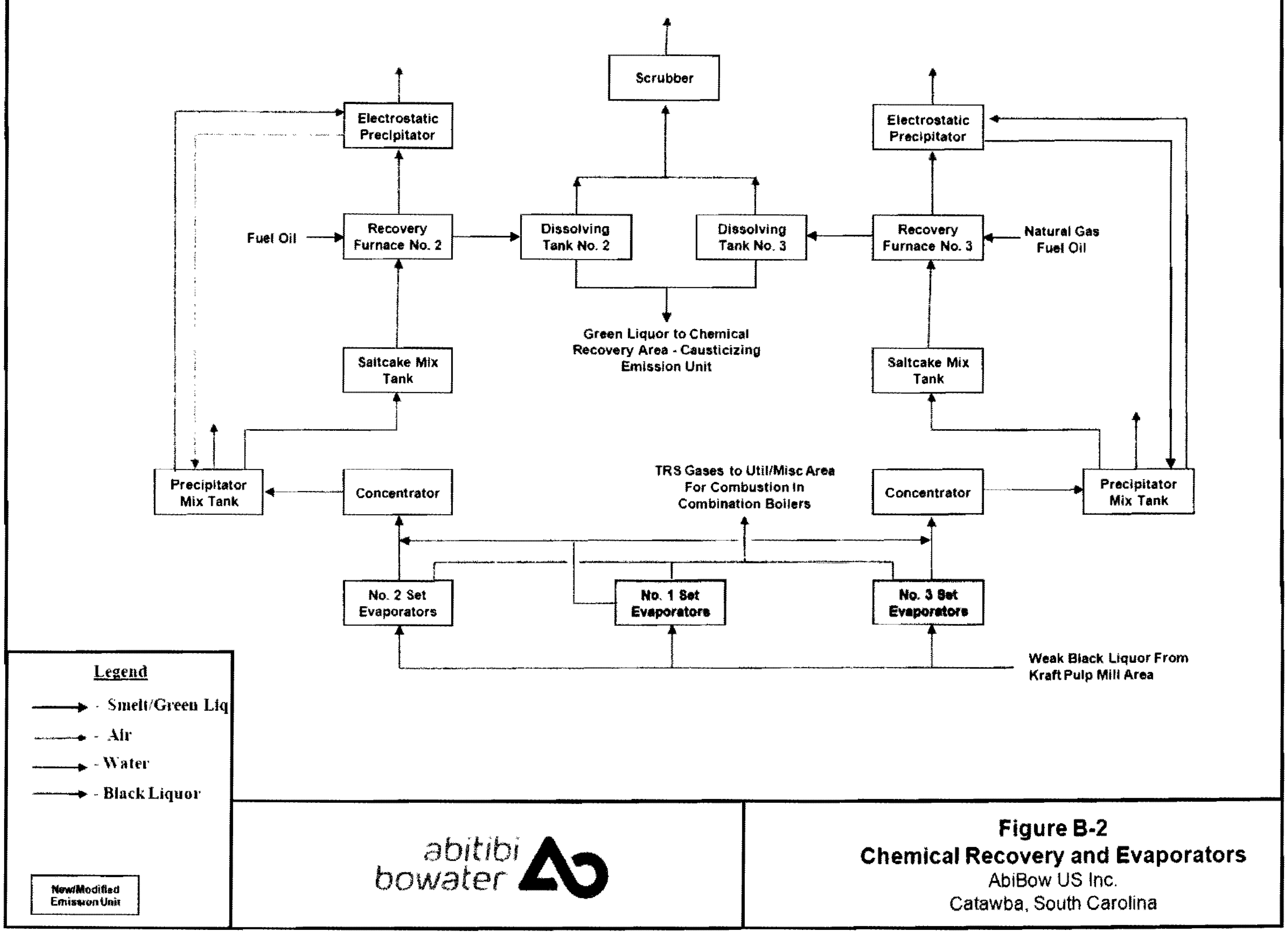

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Figure B-2
Chemical Recovery and Evaporators
AbiBow US Inc.
Catawba, South Carolina

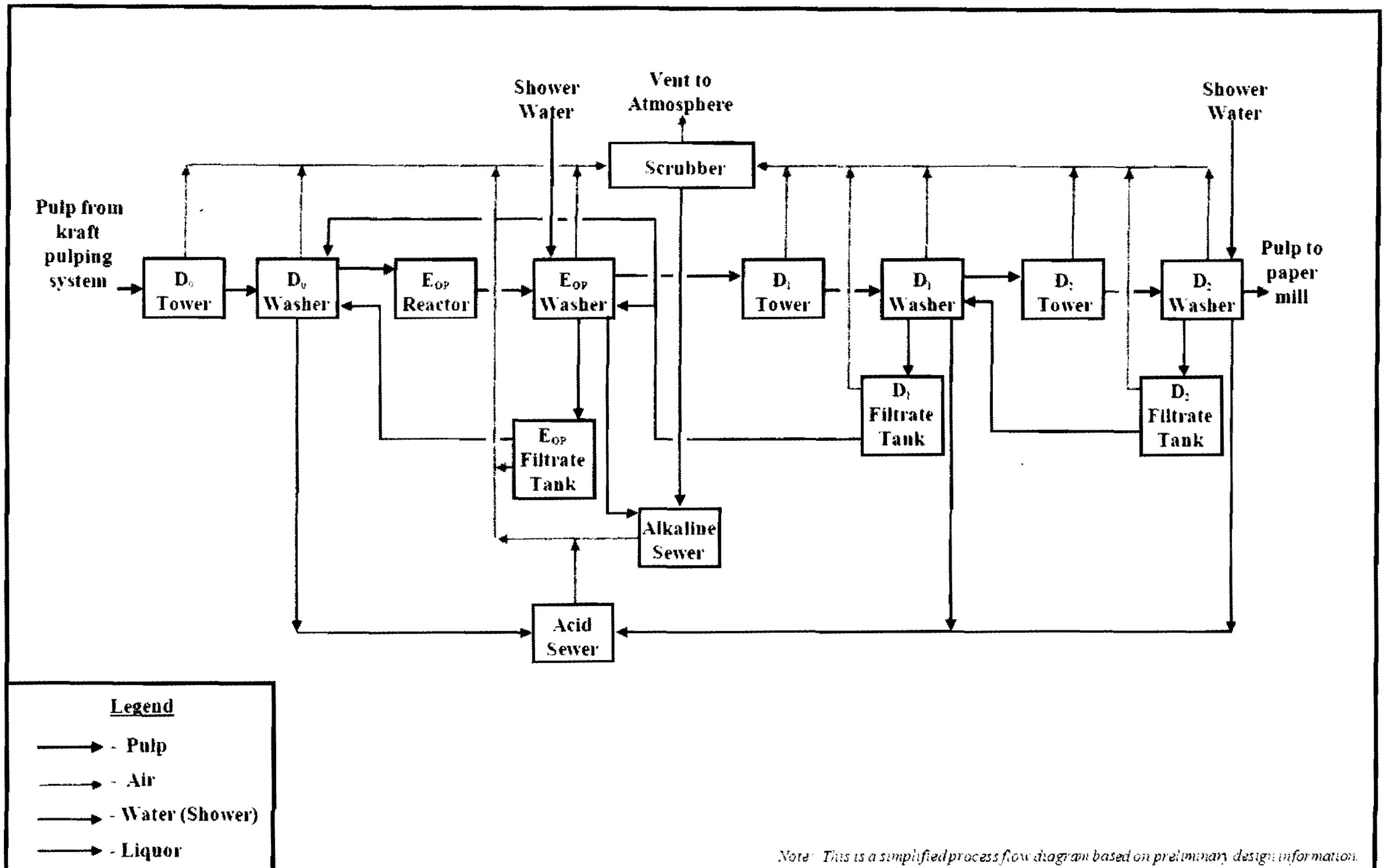

Figure B-3
Bleach Plant Area
AbiBow US Inc.
Catawba, South Carolina

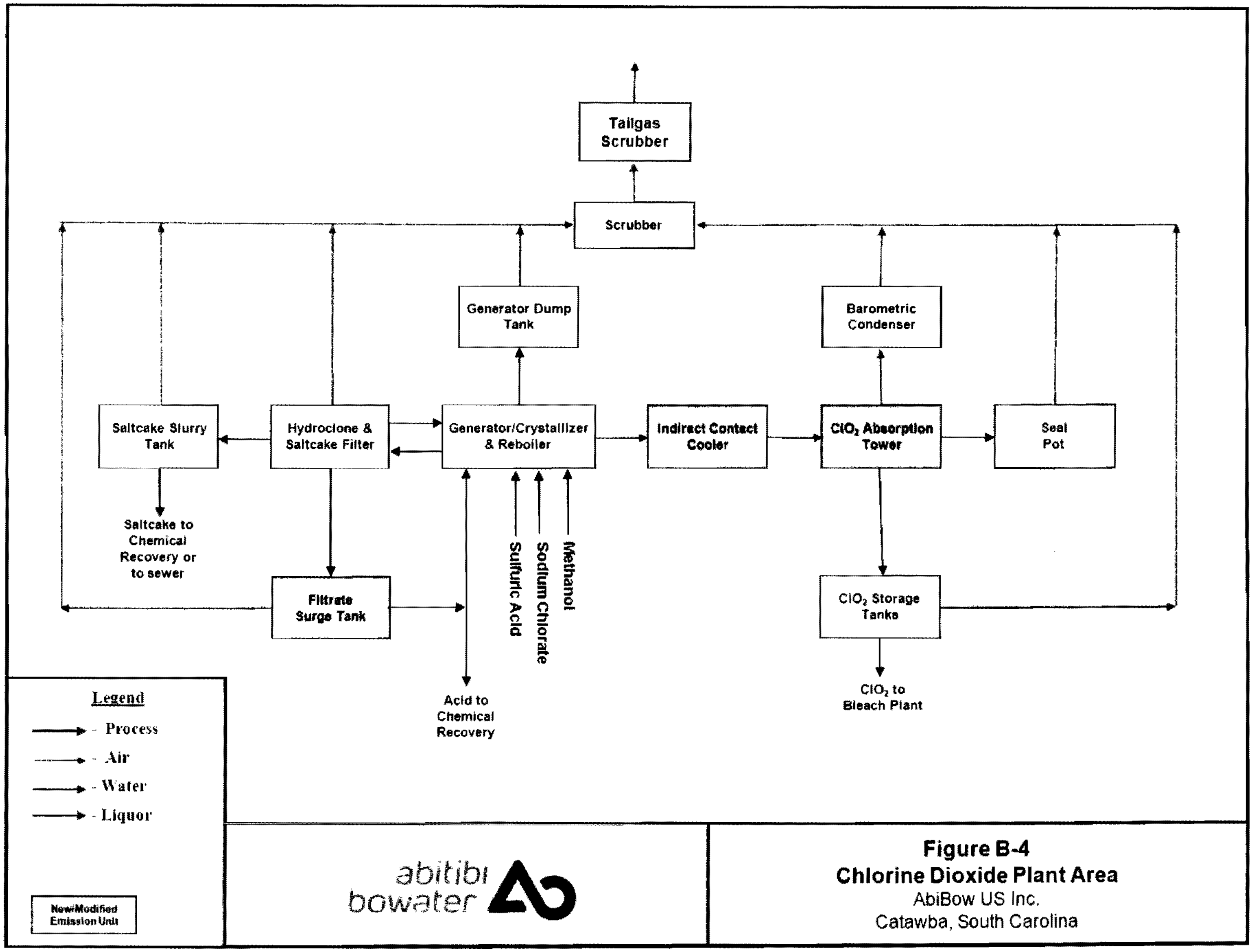

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Figure B-4
Chlorine Dioxide Plant Area
AbiBow US Inc.
Catawba, South Carolina

APPENDIX C

Emissions Calculations
Kraft Pulp Mill

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PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulping System - Summary		1,825.0	1,532.5	1,704.9	ADTP/Day

POLLUTANT	EMISSION FACTOR INFORMATION FACTOR	UNITS	NOTE	PROCESS VARIABILITY FACTOR	PROJECTED EMISSIONS (tons/yr)	BASELINE EMISSIONS (tons/yr)	COULD HAVE EMISSIONS (tons/yr)
Particulate matter					0.00	0.00	0.00
Particulate matter < 10 microns					0.00	0.00	0.00
Particulate matter < 2.5 microns					0.00	0.00	0.00
Sulfur dioxide					131.1	110.1	122.4
Volatile organic compounds (as carbon)					11.2	9.4	10.5
Volatile organic compounds (as VOC)					18.5	15.5	17.3
Carbon monoxide					15.0	12.6	14.0
Lead					0.0	0.0	0.0
Nitrogen oxides					0.0	0.0	0.0
Sulfuric acid mist					0.0	0.0	0.0
Hydrogen Sulfide					0.0	0.0	0.0
Total Reduced Sulfur (as TRS)					1.7	1.4	1.6
Total Reduced Sulfur (as Sulfur)					1.0	0.8	0.9
Total Reduced Sulfur (as Hydrogen Sulfide)					1.0	0.9	1.0
Carbon Dioxide (Biogenic)					2,086.8	1,752.3	1,949.4
Methane					0.7	0.8	0.7
Nitrous Oxide					0.1	0.1	0.1
Carbon Dixoide Equivalent					2,130.7	1,789.2	1,990.5
Total 112(b) Hazardous Air Pollutants					10.9	9.1	10.2

REFERENCES:

NOTES:

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulping System - Digester Chip Bin	5210	1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide	3.0E-01	#/ADTP	E, I	0.675	**67.4**	**56.6**	**63.0**
Volatile organic compounds (as carbon)	9.2E-01	#/ADTP	F	0.02	**6.1**	**5.1**	**5.7**
Volatile organic compounds (as VOC)	1.6E+00	#/ADTP	G	0.02	**10.7**	**8.9**	**10.0**
Carbon monoxide				1	**0.0**	**0.0**	**0.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	0.0E+00	#/ADTP	A	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as TRS)	2.7E-01	#/ADTP	C	0.01	**0.9**	**0.8**	**0.8**
Total Reduced Sulfur (as Sulfur)	1.5E-01	#/ADTP	A	0.01	**0.5**	**0.4**	**0.5**
Total Reduced Sulfur (as Hydrogen Sulfide)	1.6E-01	#/ADTP	D	0.01	**0.5**	**0.4**	**0.5**
Carbon Dioxide (Biogenic)	3.4E+00	#/ADTP	J	1	**1,124.6**	**944.3**	**1,050.5**
Methane	1.2E-03	#/ADTP	K	1	**0.4**	**0.3**	**0.4**
Nitrous Oxide	1.5E-04	#/ADTP	K	1	**0.1**	**0.0**	**0.0**
Carbon Dioxide Equivalent	3.4E+00	#/ADTP	L	1	**1,148.2**	**964.2**	**1,072.7**
Total 112(b) Hazardous Air Pollutants					**0.1**	**0.1**	**0.1**

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 9H - Continuous Digester.
B) Emission factors from New Fiberline PSD Permit Application
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
F) Emission factor from NCASI Technical Bulletin 884, Table 4.2 - adjusted from #/ton chips to #/ADTP assuming 50% yield.
G) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulping System - Digester Relief Gas	5210	1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	0.00	0.00	0.00
Particulate matter < 10 microns				1	0.00	0.00	0.00
Particulate matter < 2.5 microns				1	0.00	0.00	0.00
Sulfur dioxide	8.4E-02	#/ADTP	E, I	0.675	18.9	15.9	17.6
Volatile organic compounds (as carbon)	1.6E-03	#/ADTP	B	0.02	0.0	0.0	0.0
Volatile organic compounds (as VOC)	3.1E-03	#/ADTP	A	0.02	0.0	0.0	0.0
Carbon monoxide				1	0.0	0.0	0.0
Lead				1	0.0	0.0	0.0
Nitrogen oxides				1	0.0	0.0	0.0
Sulfuric acid mist				1	0.0	0.0	0.0
Hydrogen Sulfide	3.6E-03	#/ADTP	A	0.01	0.0	0.0	0.0
Total Reduced Sulfur (as TRS)	6.9E-02	#/ADTP	C	0.01	0.2	0.2	0.2
Total Reduced Sulfur (as Sulfur)	4.2E-02	#/ADTP	A	0.01	0.1	0.1	0.1
Total Reduced Sulfur (as Hydrogen Sulfide)	4.5E-02	#/ADTP	D	0.01	0.1	0.1	0.1
Carbon Dioxide (Biogenic)	5.8E-03	#/ADTP	J	1	1.9	1.6	1.8
Methane	2.0E-06	#/ADTP	K	1	0.0	0.0	0.0
Nitrous Oxide	2.6E-07	#/ADTP	K	1	0.0	0.0	0.0
Carbon Dioxide Equivalent	5.9E-03	#/ADTP	L	1	2.0	1.7	1.8
Total 112(b) Hazardous Air Pollutants					0.0	0.0	0.0

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 9A - Continuous Digester.
B) Emission factor adjusted from total VOC to VOC as carbon based on molecular weight of predominate VOC species.
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulping System - Digester Blow Tank	5210	1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide	3.8E-02	#/ADTP	E, I	0.675	**8.5**	**7.2**	**8.0**
Volatile organic compounds (as carbon)	3.5E-01	#/ADTP	F	0.02	**2.3**	**2.0**	**2.2**
Volatile organic compounds (as VOC)	4.1E-01	#/ADTP	G	0.02	**2.7**	**2.3**	**2.6**
Carbon monoxide				1	**0.0**	**0.0**	**0.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	3.2E-04	#/ADTP	A	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as TRS)	3.5E-02	#/ADTP	C	0.01	**0.1**	**0.1**	**0.1**
Total Reduced Sulfur (as Sulfur)	1.9E-02	#/ADTP	A	0.01	**0.1**	**0.1**	**0.1**
Total Reduced Sulfur (as Hydrogen Sulfide)	2.0E-02	#/ADTP	D	0.01	**0.1**	**0.1**	**0.1**
Carbon Dioxide (Biogenic)	1.3E+00	#/ADTP	J	1	**427.8**	**359.3**	**399.7**
Methane	4.4E-04	#/ADTP	K	1	**0.1**	**0.1**	**0.1**
Nitrous Oxide	5.8E-05	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Carbon Dioxide Equivalent	1.3E+00	#/ADTP	L	1	**436.8**	**366.8**	**408.1**
Total 112(b) Hazardous Air Pollutants					**0.1**	**0.1**	**0.1**

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 9B - Continuous Digester.
B) Emission factors from New Fiberline PSD Permit Application
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
F) Emission factor from NCASI Technical Bulletin 884, Table 4.2 - adjusted for evaporator emissions assuming 50/50 split with pulping.
G) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulping System - Pressure Diffusion Washer	5230	1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	0.00	0.00	0.00
Particulate matter < 10 microns				1	0.00	0.00	0.00
Particulate matter < 2.5 microns				1	0.00	0.00	0.00
Sulfur dioxide	7.2E-02	#/ADTP	E, I	0.675	16.2	13.6	15.1
Volatile organic compounds (as carbon)	1.3E-01	#/ADTP	F	0.02	0.9	0.7	0.8
Volatile organic compounds (as VOC)	1.5E-01	#/ADTP	G	0.02	1.0	0.8	0.9
Carbon monoxide				1	0.0	0.0	0.0
Lead				1	0.0	0.0	0.0
Nitrogen oxides				1	0.0	0.0	0.0
Sulfuric acid mist				1	0.0	0.0	0.0
Hydrogen Sulfide	5.3E-05	#/ADTP	A	0.01	0.0	0.0	0.0
Total Reduced Sulfur (as TRS)	6.5E-02	#/ADTP	C	0.01	0.2	0.2	0.2
Total Reduced Sulfur (as Sulfur)	3.6E-02	#/ADTP	A	0.01	0.1	0.1	0.1
Total Reduced Sulfur (as Hydrogen Sulfide)	3.8E-02	#/ADTP	D	0.01	0.1	0.1	0.1
Carbon Dioxide (Biogenic)	4.8E-01	#/ADTP	J	1	158.9	133.4	148.4
Methane	1.6E-04	#/ADTP	K	1	0.1	0.0	0.1
Nitrous Oxide	2.1E-05	#/ADTP	K	1	0.0	0.0	0.0
Carbon Dioxide Equivalent	4.9E-01	#/ADTP	L	1	162.2	136.2	151.6
Total 112(b) Hazardous Air Pollutants					1.2	1.0	1.1

REFERENCES:

A) Median emission factors from NCASI Technical Bulletin No. 858, Table 7 - non-vacuum drum washers.
B) Emission factors from New Fiberline PSD Permit Application
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
F) Emission factor from NCASI Technical Bulletin 884, Table 4.6.
G) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:

Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulping System - Knotters	5250	1,825.0	1,532.5	1,704.9	ADTP/Day

POLLUTANT	EMISSION FACTOR INFORMATION FACTOR	UNITS	NOTE	PROCESS VARIABILITY FACTOR	PROJECTED EMISSIONS (tons/yr)	BASELINE EMISSIONS (tons/yr)	COULD HAVE EMISSIONS (tons/yr)
Particulate matter				1	0.00	0.00	0.00
Particulate matter < 10 microns				1	0.00	0.00	0.00
Particulate matter < 2.5 microns				1	0.00	0.00	0.00
Sulfur dioxide	2.6E-03	#/ADTP	E, I	0.675	0.6	0.5	0.5
Volatile organic compounds (as carbon)	5.0E-03	#/ADTP	F	0.02	0.0	0.0	0.0
Volatile organic compounds (as VOC)	1.1E-02	#/ADTP	G	0.02	0.1	0.1	0.1
Carbon monoxide				1	0.0	0.0	0.0
Lead				1	0.0	0.0	0.0
Nitrogen oxides				1	0.0	0.0	0.0
Sulfuric acid mist				1	0.0	0.0	0.0
Hydrogen Sulfide	0.0E+00	#/ADTP	A	0.01	0.0	0.0	0.0
Total Reduced Sulfur (as TRS)	3.5E-03	#/ADTP	C	0.01	0.0	0.0	0.0
Total Reduced Sulfur (as Sulfur)	1.3E-03	#/ADTP	A	0.01	0.0	0.0	0.0
Total Reduced Sulfur (as Hydrogen Sulfide)	1.4E-03	#/ADTP	D	0.01	0.0	0.0	0.0
Carbon Dioxide (Biogenic)	1.8E-02	#/ADTP	J	1	6.1	5.1	5.7
Methane	6.3E-06	#/ADTP	K	1	0.0	0.0	0.0
Nitrous Oxide	8.2E-07	#/ADTP	K	1	0.0	0.0	0.0
Carbon Dioxide Equivalent	1.9E-02	#/ADTP	L	1	6.2	5.2	5.8
Total 112(b) Hazardous Air Pollutants					0.2	0.1	0.2

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 4.
B) Emission factors from New Fiberline PSD Permit Application
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
F) Emission factor from NCASI Technical Bulletin 884, Table 4.5.
G) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulpng System - Screens	5250	1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide	1.8E-03	#/ADTP	E, I	0.675	**0.4**	**0.3**	**0.4**
Volatile organic compounds (as carbon)	4.0E-03	#/ADTP	F	0.02	**0.0**	**0.0**	**0.0**
Volatile organic compounds (as VOC)	1.0E-02	#/ADTP	G	0.02	**0.1**	**0.1**	**0.1**
Carbon monoxide				1	**0.0**	**0.0**	**0.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	0.0E+00	#/ADTP	A	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as TRS)	1.8E-03	#/ADTP	C	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as Sulfur)	9.0E-04	#/ADTP	A	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as Hydrogen Sulfide)	9.6E-04	#/ADTP	D	0.01	**0.0**	**0.0**	**0.0**
Carbon Dioxide (Biogenic)	1.5E-02	#/ADTP	J	1	**4.9**	**4.1**	**4.6**
Methane	5.0E-06	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Nitrous Oxide	6.6E-07	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Carbon Dioxide Equivalent	1.5E-02	#/ADTP	L	1	**5.0**	**4.2**	**4.7**
Total 112(b) Hazardous Air Pollutants					**1.5**	**1.3**	**1.4**

REFERENCES:

A) Median emission factors from NCASI Technical Bulletin No. 858, Table 5.
B) Emission factors from New Fiberline PSD Permit Application
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
F) Emission factor from NCASI Technical Bulletin 884, Table 4.5.
G) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:

Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulping System - Decker	5250	1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide	7.0E-02	#/ADTP	E, I	0.675	15.7	**13.2**	**14.7**
Volatile organic compounds (as carbon)	7.7E-02	#/ADTP	F	0.02	**0.5**	**0.4**	**0.5**
Volatile organic compounds (as VOC)	1.1E-01	#/ADTP	G	0.02	**0.7**	**0.6**	**0.7**
				1	**0.0**	**0.0**	**0.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	0.0E+00	#/ADTP	A	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as TRS)	5.6E-02	#/ADTP	C	0.01	**0.2**	**0.2**	**0.2**
Total Reduced Sulfur (as Sulfur)	3.5E-02	#/ADTP	A	0.01	**0.1**	**0.1**	**0.1**
Total Reduced Sulfur (as Hydrogen Sulfide)	3.7E-02	#/ADTP	D	0.01	**0.1**	**0.1**	**0.1**
Carbon Dioxide (Biogenic)	2.8E-01	#/ADTP	J	1	**94.1**	**79.0**	**87.9**
Methane	9.6E-05	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Nitrous Oxide	1.3E-05	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Carbon Dioxide Equivalent	2.9E-01	#/ADTP	L	1	**96.1**	**80.7**	**89.8**
Total 112(b) Hazardous Air Pollutants					**0.6**	**0.5**	**0.5**

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 8.
B) Emission factors from New Fiberline PSD Permit Application
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
F) Emission factor from NCASI Technical Bulletin 884, Table 4.7.
G) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulping System - Oxygen Delignification	5240	1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide	1.2E-02	#/ADTP	E, I	0.675	**2.6**	**2.2**	**2.4**
Volatile organic compounds (as carbon)	2.0E-01	#/ADTP	F	0.02	**1.3**	**1.1**	**1.2**
Volatile organic compounds (as VOC)	4.8E-01	#/ADTP	G	0.02	**3.2**	**2.7**	**3.0**
Carbon monoxide	4.5E-02	#/ADTP	F	1	**15.0**	**12.6**	**14.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	2.7E-03	#/ADTP	A	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as TRS)	9.3E-03	#/ADTP	C	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as Sulfur)	5.8E-03	#/ADTP	A	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as Hydrogen Sulfide)	6.2E-03	#/ADTP	D	0.01	**0.0**	**0.0**	**0.0**
Carbon Dioxide (Biogenic)	8.0E-01	#/ADTP	J	1	**268.0**	**225.0**	**250.4**
Methane	2.7E-04	#/ADTP	K	1	**0.1**	**0.1**	**0.1**
Nitrous Oxide	3.6E-05	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Carbon Dioxide Equivalent	8.2E-01	#/ADTP	L	1	**273.6**	**229.8**	**255.6**
Total 112(b) Hazardous Air Pollutants					**7.2**	**6.0**	**6.7**

REFERENCES:

A) Median emission factors from NCASI Technical Bulletin No. 858, Table 3.
B) Emission factors from New Fiberline PSD Permit Application
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
F) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
G) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:

Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Pulping System - Turpentine Recovery	5220	1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide	6.0E-03	#/ADTP	E, I	0.3375	**0.7**	**0.6**	**0.6**
Volatile organic compounds (as carbon)	3.5E-04	#/ADTP	B	0.02	**0.0**	**0.0**	**0.0**
Volatile organic compounds (as VOC)	9.2E-04	#/ADTP	A	0.02	**0.0**	**0.0**	**0.0**
Carbon monoxide				1	**0.0**	**0.0**	**0.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	2.5E-04	#/ADTP	A	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as TRS)	5.0E-03	#/ADTP	C	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as Sulfur)	3.0E-03	#/ADTP	A	0.01	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as Hydrogen Sulfide)	3.2E-03	#/ADTP	D	0.01	**0.0**	**0.0**	**0.0**
Carbon Dioxide (Biogenic)	1.3E-03	#/ADTP	J	1	**0.4**	**0.4**	**0.4**
Methane	4.4E-07	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Nitrous Oxide	5.8E-08	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Carbon Dioxide Equivalent	1.3E-03	#/ADTP	L	1	**0.4**	**0.4**	**0.4**
Total 112(b) Hazardous Air Pollutants					**0.0**	**0.0**	**0.0**

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 9I.
B) Emission factor adjusted from total VOC to VOC as carbon based on molecular weight of predominate VOC species.
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 50% removal of TRS in LVHC system scrubber and 100% conversion of TRS into SO2.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction due to JVHC scrubber (50%) and sulfur capture by wood ash (32.5%) in combination boilers

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Evaporator System - Summary		1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter					**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns					**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns					**0.00**	**0.00**	**0.00**
Sulfur dioxide					**368.7**	**309.6**	**344.4**
Volatile organic compounds (as carbon)					**1.2**	**1.0**	**1.1**
Volatile organic compounds (as VOC)					**3.3**	**2.7**	**3.0**
Carbon monoxide					**0.0**	**0.0**	**0.0**
Lead					**0.0**	**0.0**	**0.0**
Nitrogen oxides					**0.0**	**0.0**	**0.0**
Sulfuric acid mist					**0.0**	**0.0**	**0.0**
Hydrogen Sulfide					**3.0**	**2.5**	**2.8**
Total Reduced Sulfur (as TRS)					**7.1**	**6.0**	**6.6**
Total Reduced Sulfur (as Sulfur)					**5.5**	**4.6**	**5.1**
Total Reduced Sulfur (as Hydrogen Sulfide)					**5.8**	**4.9**	**5.4**
Carbon Dioxide (Biogenic)					**224.3**	**188.4**	**209.6**
Methane					**0.1**	**0.1**	**0.1**
Nitrous Oxide					**0.0**	**0.0**	**0.0**
Carbon Dixoide Equivalent					**229.0**	**192.3**	**214.0**
Total 112(b) Hazardous Air Pollutants					**3.3**	**2.8**	**3.1**

REFERENCES:

NOTES:
Evaporator No. 1 (modified) is 34.3% of baseline evaporator capacity and 34.9% of projected future capacity.
Evaporator No. 2 (not modified) is 32.2% of baseline evaporator capacity and 31.1% of projected future capacity.
Evaporator No. 3 (modified) is 33.5% of baseline evaporator capacity and 34.0% of projected future capacity.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Evaporator System - No. 1 Evaporator Set	2400	636.9	525.6	584.8	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide	3.28E+00	#/ADTP	E, I	0.3375	**128.7**	**106.2**	**118.1**
Volatile organic compounds (as carbon)	1.8E-01	#/ADTP	F	0.02	**0.4**	**0.4**	**0.4**
Volatile organic compounds (as VOC)	4.9E-01	#/ADTP	B	0.02	**1.1**	**0.9**	**1.0**
Carbon monoxide				1	**0.0**	**0.0**	**0.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	9.1E-01	#/ADTP	B	0.01	**1.1**	**0.9**	**1.0**
Total Reduced Sulfur (as TRS)	2.13E+00	#/ADTP	C	0.01	**2.5**	**2.0**	**2.3**
Total Reduced Sulfur (as Sulfur)	1.64E+00	#/ADTP	B	0.01	**1.9**	**1.6**	**1.8**
Total Reduced Sulfur (as Hydrogen Sulfide)	1.75E+00	#/ADTP	D	0.01	**2.0**	**1.7**	**1.9**
Carbon Dioxide (Biogenic)	6.74E-01	#/ADTP	J	1	**78.3**	**64.6**	**71.9**
Methane	2.30E-04	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Nitrous Oxide	3.02E-05	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Carbon Dioxide Equivalent	6.88E-01	#/ADTP	L	1	**79.9**	**66.0**	**73.4**
Total 112(b) Hazardous Air Pollutants					**1.1**	**0.9**	**1.1**

REFERENCES:

A) Emission factors from NCASI Technical Bulletin 858, Table 9C - Evaporators at Mills with Continuous Digesters.
B) Emission factors based on Bowater source testing September 11, 1996.
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 50% removal of TRS in LVHC system scrubber and 100% conversion of TRS into SO2.
F) Emission factor adjusted from total VOC to VOC as carbon based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:

Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Baseline actual production is December 2007 through November 2009
Projected production from PSD construction permit DA.
Total reduced sulfur (as TRS) emission is the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction due to LVHC scrubber (50%) and sulfur capture by wood ash (32.5%) in combination boilers

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Evaporator System - No. 2 Evaporator Set	2500	567.6	493.5	549.0	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide	3.28E+00	#/ADTP	E, I	0.3375	**114.7**	**99.7**	**110.9**
Volatile organic compounds (as carbon)	1.8E-01	#/ADTP	F	0.02	**0.4**	**0.3**	**0.4**
Volatile organic compounds (as VOC)	4.9E-01	#/ADTP	B	0.02	**1.0**	**0.9**	**1.0**
Carbon monoxide				1	**0.0**	**0.0**	**0.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	9.1E-01	#/ADTP	B	0.01	**0.9**	**0.8**	**0.9**
Total Reduced Sulfur (as TRS)	2.13E+00	#/ADTP	C	0.01	**2.2**	**1.9**	**2.1**
Total Reduced Sulfur (as Sulfur)	1.64E+00	#/ADTP	B	0.01	**1.7**	**1.5**	**1.6**
Total Reduced Sulfur (as Hydrogen Sulfide)	1.75E+00	#/ADTP	D	0.01	**1.8**	**1.6**	**1.8**
Carbon Dioxide (Biogenic)	6.74E-01	#/ADTP	J	1	**69.8**	**60.7**	**67.5**
Methane	2.30E-04	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Nitrous Oxide	3.02E-05	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Carbon Dioxide Equivalent	6.88E-01	#/ADTP	L	1	**71.2**	**61.9**	**68.9**
Total 112(b) Hazardous Air Pollutants					**1.0**	**0.9**	**1.0**

REFERENCES:
A) Emission factors from NCASI Technical Bulletin 858, Table 9C - Evaporators at Mills with Continuous Digesters.
B) Emission factors based on Bowater source testing September 11, 1996.
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 50% removal of TRS in LVHC system scrubber and 100% conversion of TRS into SO2.
F) Emission factor adjusted from total VOC to VOC as carbon based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Baseline actual production is December 2007 through November 2009
Projected production from PSD construction permit DA.
Total reduced sulfur (as TRS) emission is the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction due to LVHC scrubber (50%) and sulfur capture by wood ash (32.5%) in combination boilers

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Evaporator System - No. 3 Evaporator Set	5100	620.5	513.4	571.1	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide	3.28E+00	#/ADTP	E, I	0.3375	**125.4**	**103.7**	**115.4**
Volatile organic compounds (as carbon)	1.8E-01	#/ADTP	F	0.02	**0.4**	**0.3**	**0.4**
Volatile organic compounds (as VOC)	4.9E-01	#/ADTP	B	0.02	**1.1**	**0.9**	**1.0**
Carbon monoxide				1	**0.0**	**0.0**	**0.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	9.1E-01	#/ADTP	B	0.01	**1.0**	**0.9**	**0.9**
Total Reduced Sulfur (as TRS)	2.13E+00	#/ADTP	C	0.01	**2.4**	**2.0**	**2.2**
Total Reduced Sulfur (as Sulfur)	1.64E+00	#/ADTP	B	0.01	**1.9**	**1.5**	**1.7**
Total Reduced Sulfur (as Hydrogen Sulfide)	1.75E+00	#/ADTP	D	0.01	**2.0**	**1.6**	**1.8**
Carbon Dioxide (Biogenic)	6.74E-01	#/ADTP	J	1	**76.3**	**63.1**	**70.2**
Methane	2.30E-04	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Nitrous Oxide	3.02E-05	#/ADTP	K	1	**0.0**	**0.0**	**0.0**
Carbon Dioxide Equivalent	6.88E-01	#/ADTP	L	1	**77.9**	**64.4**	**71.7**
Total 112(b) Hazardous Air Pollutants					**1.1**	**0.9**	**1.0**

REFERENCES:
A) Emission factors from NCASI Technical Bulletin 858, Table 9C - Evaporators at Mills with Continuous Digesters.
B) Emission factors based on Bowater source testing September 11, 1996.
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 50% removal of TRS in LVHC system scrubber and 100% conversion of TRS into SO2.
F) Emission factor adjusted from total VOC to VOC as carbon based on molecular weight of predominate VOC species.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Baseline actual production is December 2007 through November 2009
Projected production from PSD construction permit DA.
Total reduced sulfur (as TRS) emission is the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction due to LVHC scrubber (50%) and sulfur capture by wood ash (32.5%) in combination boilers

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Condensate System	9801	1,825.0	1,532.5	1,704.9	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	0.00	0.00	0.00
Particulate matter < 10 microns				1	0.00	0.00	0.00
Particulate matter < 2.5 microns				1	0.00	0.00	0.00
Sulfur dioxide	6.2E+00	#/ADTP	E, I	0.675	1,393.9	1,170.5	1,302.1
Volatile organic compounds (as carbon)	5.64E+00	#/ADTP	H	0.02	37.6	31.5	35.1
Volatile organic compounds (as VOC)	1.05E+01	#/ADTP	A	0.02	69.7	58.6	65.2
Carbon monoxide	7.28E-02	#/ADTP	F	1	24.2	20.3	22.6
Lead				1	0.0	0.0	0.0
Nitrogen oxides	7.18E-01	#/ADTP	F	1	239.1	200.8	223.3
Sulfuric acid mist	4.9E-03	#/ADTP	G	1	1.6	1.4	1.5
Hydrogen Sulfide	9.2E-01	#/ADTP	A	0.01	3.1	2.6	2.9
Total Reduced Sulfur (as TRS)	4.6E+00	#/ADTP	C	0.01	15.3	12.8	14.3
Total Reduced Sulfur (as Sulfur)	3.1E+00	#/ADTP	A	0.01	10.3	8.7	9.6
Total Reduced Sulfur (as Hydrogen Sulfide)	3.3E+00	#/ADTP	D	0.01	11.0	9.2	10.2
Carbon Dioxide (Biogenic)	2.1E+01	#/ADTP	J	1	6,932.0	5,821.0	6,475.9
Methane	7.1E-03	#/ADTP	K	1	2.4	2.0	2.2
Nitrous Oxide	9.3E-04	#/ADTP	K	1	0.3	0.3	0.3
Carbon Dioxide Equivalent	2.1E+01	#/ADTP	L	1	7,077.9	5,943.5	6,612.1
Total 112(b) Hazardous Air Pollutants					102.0	85.6	95.3

REFERENCES:
A) Emission factors from NCASI Technical Bulletin 858, Table 9D - Condensate Stripper at Mills with Batch Digesters (no factors for Mills Continuous Digester).
B) Emission factor based on Bowater MACT compliance demonstration December 2003.
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
F) Emission factor from NCASI Technical Bulletin 884, Table 4.4 - adjusted to ADTP using actual 2004 condensate flow and production.
G) Emission factor from NCASI Technical Bulletin 858, Table 10 - Thermal Oxidizers.
H) Emission factor adjusted from total VOC to VOC as carbon based on molecular weight of predominate VOC species.
I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.
J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.
K) Emission factor based on ratio of emission factors for solid biomass combustion in EPA MRR, Table C-1 and C-2.
L) Emission factor based on GWP in EPA MRR, Table A-1.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

Sulfur Capture in Combination Boilers

The National Council for Air and Stream Improvement (NCASI) has documented the inherent sulfur capture in combination bark boilers, due to the alkalinity of the boiler ashes. The sulfur capture is a function of the sulfur to wood ratio in the boiler. The percent of sulfur captured in wood-fired combination boilers from NCASI technical bulletin 640 is:

$$Y = 122.34 * X^{0.50}$$

where: Y = percent sulfur capture
X = ton wood residue/lb sulfur in combined fuel

<u>Average sulfur from No. 6 Oil firing (boilers do not burn maximum oil and wood simultaneously):</u>
No. 6 Oil sulfur content = 2.1%
CB1 Oil in 2009 = 852 gal/day × 7.88 lb/gal × 0.021 lb S/gal = 141 lb/day
CB2 Oil in 2009 = 1,142 gal/day × 7.88 lb/gal × 0.021 lb S/gal = 189 lb/day

<u>Maximum sulfur from TDF firing:</u>
TDF sulfur content = 1.23%
CB1 = 36.0 tons/day × 2,000 lb/ton × 0.0123 lb S/lb TDF = 886 lb/day
CB2 = 36.0 tons/day × 2,000 lb/ton × 0.0123 lb S/lb TDF = 886 lb/day

<u>Maximum sulfur from NCG burning:</u>
HVLC from 2009 AEI = 0.26 lb TRS as S/ADTP
LVHC from 2009 AEI = 0.82 lb TRS as S/ADTP (including 50% reduction from TRS scrubber)
SOG from 2009 AEI = 3.1 lb TRS as S/ADTP
NCG = SOG + LVHC + HVLC = 3.1 + 0.82 + 0.26 = 4.18 lb S/ADTP
1,825 ADTP/day × 4.18 lb S/ADTP = 7,629 lb/day

<u>Sulfur input to combination boilers:</u>
CB1 = 141 + 886 + 7,629 = 8,656 lb/day
CB2 = 189 + 886 + 7,629 = 8,704 lb/day

<u>Sulfur Capture:</u>
CB1 average wood in 2009 = 616 tons/day
CB1-X = 616 tons wood/day ÷ 8,656 lb S/day = 0.071
CB1-Y = $122.34 \times 0.071^{0.50} = 122.34 \times 0.266$ = 32.5% sulfur capture

CB1 average wood in 2009 = 827 tons/day
CB2-X = 827 tons wood/day ÷ 8,704 lb S/day = 0.095
CB2-Y = $122.34 \times 0.095^{0.50} = 122.34 \times 0.31$ = 37.9% sulfur capture

The emissions of SO_2 resulting from the combustion of pulp mill non-condensable gases (NCG's) will be reduced by 32.5% due to sulfur capture by the wood ash in the combination boilers.

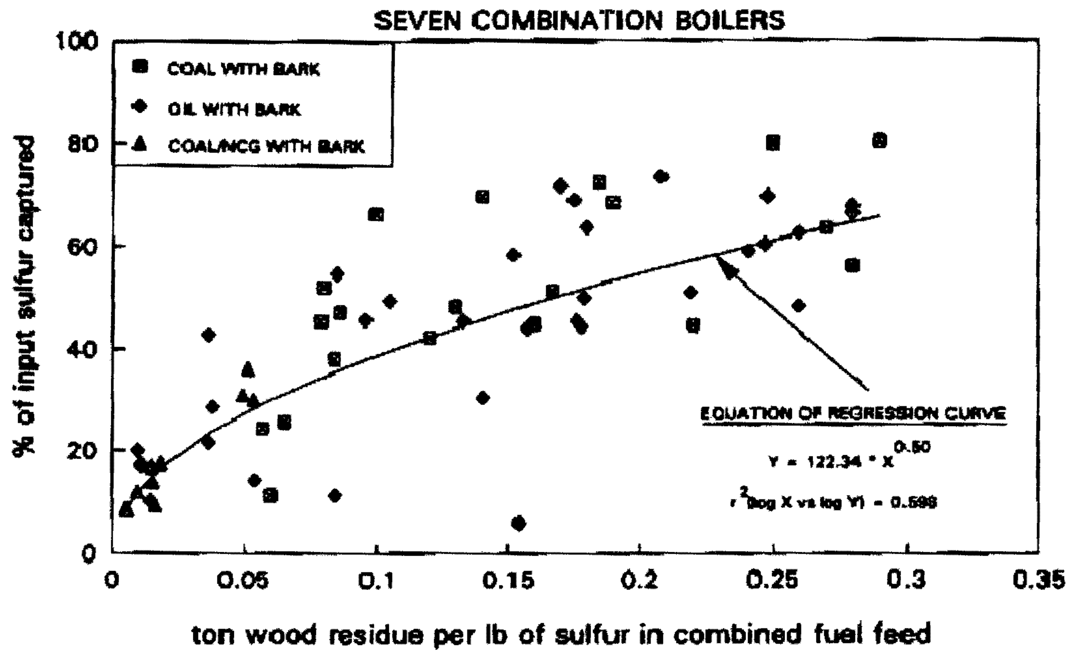

FIGURE 11 SUMMARY OF GAS-SOLID SULFUR CAPTURE IN COMBINATION BOILERS

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APPENDIX D

Emissions Calculations

Kraft Bleaching System

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PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Bleaching System - Bleach Plant	5300	1,752.0	1,455.8	1,619.7	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide				1	**0.0**	**0.0**	**0.0**
Volatile organic compounds (as carbon)	5.0E-02	#/ODTP	B	1	**16.0**	**13.3**	**14.8**
Volatile organic compounds (as VOC)	2.7E-01	#/ODTP	E	1	**86.3**	**71.7**	**79.8**
Carbon monoxide	8.9E-01	#/ODTP	B	1	**284.9**	**236.7**	**263.4**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide				1	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as TRS)	4.4E-03	#/ADTP	C	1	**1.4**	**1.2**	**1.3**
Total Reduced Sulfur (as Sulfur)	2.8E-03	#/ADTP	A	1	**0.9**	**0.7**	**0.8**
Total Reduced Sulfur (as Hydrogen Sulfide)	3.0E-03	#/ADTP	D	1	**1.0**	**0.8**	**0.9**
Carbon Dioxide (Biogenic)							
Methane							
Nitrous Oxide							
Carbon Dixoide Equivalent							
Total 112(b) Hazardous Air Pollutants					**76.4**	**63.5**	**70.6**

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 2A.
B) Emission factor from NCASI Technical Bulletin 884, Table 4.9.
C) Sum of dimethyl disulfide, dimethyl sulfide, hydrogen sulfide, and methyl mercaptan emissions.
D) Assumed TRS (as S) converted to H2S based on molecular weight.
E) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.

H) Emission factor from Bowater stack test February 2004.

J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Kraft Bleaching System - ClO2 Generating Plant	1790	40.0	27.9	30.9	T ClO2/Day

POLLUTANT	EMISSION FACTOR INFORMATION FACTOR	UNITS	NOTE	PROCESS VARIABILITY FACTOR	PROJECTED EMISSIONS (tons/yr)	BASELINE EMISSIONS (tons/yr)	COULD HAVE EMISSIONS (tons/yr)
Particulate matter				1	**0.00**	**0.00**	**0.00**
Particulate matter < 10 microns				1	**0.00**	**0.00**	**0.00**
Particulate matter < 2.5 microns				1	**0.00**	**0.00**	**0.00**
Sulfur dioxide				1	**0.0**	**0.0**	**0.0**
Volatile organic compounds (as carbon)	1.69E-02	#/T ClO2	C, B	1	**0.1**	**0.1**	**0.1**
Volatile organic compounds (as VOC)	6.00E-02	#/T ClO2	E	1	**0.4**	**0.3**	**0.3**
Carbon monoxide				1	**0.0**	**0.0**	**0.0**
Lead				1	**0.0**	**0.0**	**0.0**
Nitrogen oxides				1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist				1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide				1	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as TRS)				1	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as Sulfur)				1	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as Hydrogen Sulfide)				1	**0.0**	**0.0**	**0.0**
Carbon Dioxide (Biogenic)							
Methane							
Nitrous Oxide							
Carbon Dixoide Equivalent							
Total 112(b) Hazardous Air Pollutants					**0.2**	**0.2**	**0.2**

REFERENCES:

A) Highest average emission factors from NCASI Technical Bulletin No. 677, ClO2 Generators with scrubbers at mills E, K and N.
B) Highest average emission factors from NCASI Technical Bulletin No. 677 (THC - method 25A), ClO2 Generators with scrubbers at mills E, K and N.
C) Emission Limit from Permit 2440-0005-CJ, Condition II.A.
D) Emission factor from Bowater stack test conducted November 1997.
E) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.

J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.

NOTES:

Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

APPENDIX E

Emissions Calculations

Pulp Dryer

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PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	BASELINE PRODUCTION	COULD HAVE PRODUCTION	PRODUCTION UNITS
Pulp Dryer	2100	811.9	667.6	782.0	ADTFP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	BASELINE EMISSIONS	COULD HAVE EMISSIONS
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(tons/yr)	(tons/yr)	(tons/yr)
Particulate matter	5.80E-03	#/ADTFP	C	1	**0.86**	**0.71**	**0.83**
Particulate matter < 10 microns	5.80E-03	#/ADTFP	C	1	**0.86**	**0.71**	**0.83**
Particulate matter < 2.5 microns	5.80E-03	#/ADTFP	C	1	**0.86**	**0.71**	**0.83**
Sulfur dioxide	0.00E+00			1	**0.0**	**0.0**	**0.0**
Volatile organic compounds (as carbon)	1.04E-01	#/ADTFP	A	1	**15.4**	**12.7**	**14.8**
Volatile organic compounds (as VOC)	3.80E-01	#/ADTFP	B	1	**56.3**	**46.3**	**54.2**
Carbon monoxide	0.00E+00			1	**0.0**	**0.0**	**0.0**
Lead	0.00E+00			1	**0.0**	**0.0**	**0.0**
Nitrogen oxides	0.00E+00			1	**0.0**	**0.0**	**0.0**
Sulfuric acid mist	0.00E+00			1	**0.0**	**0.0**	**0.0**
Hydrogen Sulfide	0.0E+00			1	**0.0**	**0.0**	**0.0**
Total Reduced Sulfur (as TRS)	9.9E-03	#/ADTFP	A	1	**1.5**	**1.2**	**1.4**
Total Reduced Sulfur (as Sulfur)	6.6E-03	#/ADTFP	A	1	**1.0**	**0.8**	**0.9**
Total Reduced Sulfur (as Hydrogen Sulfide)	7.0E-03	#/ADTFP	A	1	**1.0**	**0.9**	**1.0**
Carbon Dioxide (Biogenic)							
Methane							
Nitrous Oxide							
Carbon Dixoide Equivalent							
Total 112(b) Hazardous Air Pollutants					**27.1**	**22.3**	**26.1**

REFERENCES:
A) Average emission factors from NCASI Technical Bulletin No. 701, Table 18 - Pulp Dryer.
B) Emission factor adjusted from VOC as carbon to total VOC based on molecular weight of predominate VOC species.
C) Emission factor from NCASI Technical Blletin No. 884.

J) Emission factor assuming 100% conversion of carbon (VOC as C and CO) into carbon dioxide from NCG combustion.

NOTES:
Emission factor of zero (0.00E+00) indicates pollutant was tested for and not detected above quantitation limit.
Actual production is calendar year 2005 production rate.
Maximum production is permitted production rate.
Total reduced sulfur emission are the sum of emissions of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.
Process variablity factors for TRS and VOC reflect assumed minimum percent reductions (99% and 98%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

APPENDIX F

Historical Production Rates

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The historical monthly production rates used to determine the could have accommodated emissions are presented in the table below. These production rates represent the production capabilities of the equipment prior to the proposed project. This is the currently accepted approach by EPA Region 4 as outline in the Mach 18, 2010 memo (attached).

Historical Production Data

Month	Kraft Pulp Production TPD	Bleached Pulp Production TPD	Pulp Dryer Production TPD	ClO_2 Plant Production TPD
December-07	1,543.5	1,466.4	672.6	28.1
January-08	1,541.9	1,464.8	652.5	29.5
February-08	1,533.9	1,457.2	670.4	29.3
March-08	1,672.2	1,588.6	738.6	30.9
April-08	1,562.1	1,484.0	648.9	28.0
May-08	1,606.9	1,526.6	699.6	28.8
June-08	1,464.1	1,390.9	592.3	27.2
July-08	1,324.1	1,257.9	528.6	23.5
August-08	1,685.0	1,600.7	673.1	28.3
September-08	1,641.3	1,559.3	696.8	28.7
October-08	1,671.2	1,587.7	634.6	30.7
November-08	1,620.7	1,539.7	668.3	30.7
December-08	1,106.8	1,051.5	459.0	26.7
January-09	1,382.4	1,313.2	548.7	25.6
February-09	1,140.7	1,083.6	448.8	20.7
March-09	1,474.9	1,401.2	764.9	26.5
April-09	1,631.7	1,550.1	782.0	28.2
May-09	1,557.5	1,479.7	780.7	28.8
June-09	1,628.2	1,546.8	762.9	29.2
July-09	1,549.5	1,472.0	781.7	27.9
August-09	1,615.0	1,534.2	736.1	28.0
September-09	1,704.9	1,619.7	772.1	29.8
October-09	1,610.7	1,530.2	693.4	29.1
November-09	1,509.9	1,434.4	615.4	24.8
24-mo. Maximum	**1,704.9**	**1,619.7**	**782.0**	**30.9**
24-mo. Average	**1,532.5**	**1,455.8**	**667.6**	**27.9**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MAR 1 8 2010

Mark Robinson
Plant Manager
Georgia-Pacific Wood Products LLC
Highway 13 North
Columbia, Mississippi 39429

Dear Mr. Robinson,

On December 1, 2009, the Mississippi Department of Environmental Quality (MDEQ) forwarded to the Environmental Protection Agency (EPA) your 502(b)(10) change request dated November 16, 2009. Please note that Mississippi regulations at APC-S-6 Section IV.F require that facilities provide EPA as well as MDEQ with written notification in advance of the proposed changes. In the future, you must provide EPA with a copy of any 502(b)(10) changes.

On December 2, 2009, EPA notified MDEQ via e-mail about concerns regarding Georgia Pacific's use of the "demand growth exclusion" in 40 CFR 52.21(b)(41)(ii)(*c*) and whether the "Vortex Burners" project qualified as a 502(b)(10) change. On December 14, 2009, representatives from Georgia Pacific met with EPA Region 4 to discuss the 502(b)(10) change request and provided additional information regarding the project.

After further review and consideration, and contingent on the information submitted being accurate and complete, EPA acknowledges that Georgia Pacific's use of the "demand growth exclusion" for calculating applicability of the Prevention of Significant Deterioration (PSD) permitting requirements is adequate and the project does qualify as a 502(b)(10) change. However, we have some points of clarification regarding statements made on the 502(b)(10) change request letter.

We acknowledge that Georgia Pacific may use the highest demonstrated average monthly operating level during the baseline period as an approximation of the level of operation that the units "could have accommodated" during the baseline period. However, EPA disagrees with the statement that Georgia Pacific "...does not accept this as the limit on excludable emissions during the baseline..." and the statement that the excludable amount under the "demand growth exclusion" is "...the highest amount that the unit could have legally and physically emitted during the baseline..." For PSD applicability purposes, the concept of emissions that "could have been accommodated" is relevant only in conjunction with the source's calculation of "projected actual emissions." That is, once the projected actual emissions from the source following the proposed project have been determined, the source may exclude from the projection "that portion of the unit's emissions following the project that an existing unit could have accommodated" during the baseline period, and "that are also unrelated to the particular project." See 40 CFR 52.21(b)(41)(ii)(*c*). Accordingly, before any given emissions may be excluded under 40 CFR 52.21(b)(41)(ii)(*c*) on the basis that they result from future demand growth, those emissions must first be part of the projected actual emissions based on "all relevant information" [see e.g., 40 CFR 52.21(b)(41)(ii)(*a*)] used to make the emissions projection.

In summary, although we do not agree with some of the statements made by Georgia Pacific in the 502(b)(10) change request as explained above, based on the information submitted, we agree with Georgia Pacific's use of the "demand growth exclusion" for determining PSD applicability for the "Vortex Burners" project. Since the "Vortex Burners" project is not considered a Title I modification, and does not exceed emissions allowable under the permit, the change qualifies as a 502(b)(10) change. If you have any questions, you may contact Heather Abrams at (404) 562-9185 or Yolanda Adams at (404) 562-9214.

Sincerely,

Gregg M. Worley

Gregg M. Worley
Chief
Air Permits Section

Enclosures

1. Letter dated November 16, 2009
2. Example VOC Emissions for Kiln 2 and 3

cc: Mr. Scott Hodges – MDEQ
Ms. Maria Zufall – Georgia-Pacific

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APPENDIX G

Future Production Rates

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Future Production Data

Year	Kraft Pulp Production TPD	Bleached Pulp Production TPD	Pulp Dryer Production TPD	ClO_2 Plant Production TPD
2012	1,825*	1,752*	811.8*	40
2013	1,825*	1,752*	811.8*	40
2014	1,825*	1,752*	811.8*	40
2015	1,825*	1,752*	811.8*	40
2016	1,825*	1,752*	811.8*	40

* Future Production from Construction Permit 2440-0005-DA.

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APPENDIX H

Coated Paper Production Rates

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The Catawba Mill manufactures coated paper grades No.3, No. 4, and No. 5 for a wide variety of commercial printing applications, using various blends of kraft pulp and TMP. The production of coated paper is market driven, and depends on the specific grades of coated paper ordered by customers. The excess kraft pulp not required for coated paper production is available for market pulp manufacturing on the pulp dryer.

The proposed project will not change the market demand for coated paper grades manufactured at the Catawba Mill. The proposed project will increase kraft pulp production, resulting in more excess kraft becoming available for market pulp in the future.

A recent illustration of this effect is evident in the mill production data from 2009. During the period from March through August 2009, coated paper production on the No. 1 Paper Machine was curtailed due to weak market demand, and the market pulp production on the pulp dryer was correspondingly higher. In September 2009, coated paper production returned to normal levels on the No. 1 paper machine. However, the higher market pulp production was sustained through September 2009 due to the peak in kraft mill production during the month.

Coated Paper Production Data

Month	Kraft Pulp Production TPD	Pulp Dryer Production TPD	No. 1 Paper Machine TPD	No. 2 Paper Machine TPD	No. 3 Paper Machine TPD
December-07	1,543.5	672.6	414.3	676.6	970.8
January-08	1,541.9	652.5	420.8	631.9	952.8
February-08	1,533.9	670.4	431.9	649.3	972.7
March-08	1,672.2	738.6	428.0	667.6	980.1
April-08	1,562.1	648.9	420.4	661.0	1,017.8
May-08	1,606.9	699.6	417.8	699.8	925.2
June-08	1,464.1	592.3	428.0	664.7	966.9
July-08	1,324.1	528.6	399.2	691.3	886.3
August-08	1,685.0	673.1	429.1	625.9	965.3
September-08	1,641.3	696.8	396.4	652.7	920.2
October-08	1,671.2	634.6	421.3	666.8	988.8
November-08	1,620.7	668.3	433.6	625.6	969.0
December-08	1,106.8	459.0	322.9	469.1	586.3
January-09	1,382.4	548.7	407.4	564.7	907.2
February-09	1,140.7	448.8	312.1	459.2	750.7
March-09	1,474.9	764.9	0.0	653.0	926.1
April-09	1,631.7	782.0	118.1	678.2	935.1
May-09	1,557.5	780.7	229.5	486.5	711.9
June-09	1,628.2	762.9	137.6	679.8	922.7
July-09	1,549.5	781.7	87.3	564.0	873.2
August-09	1,615.0	736.1	249.7	660.5	952.9
September-09	1,704.9	772.1	391.9	590.9	946.5
October-09	1,610.7	693.4	400.8	620.0	901.6
November-09	1,509.9	615.4	366.6	668.1	865.2
24-mo. Maximum	**1,704.9**	**782.0**	**433.6**	**699.8**	**1,017.8**
24-mo. Average	**1,532.5**	**667.6**	**336.0**	**625.3**	**908.1**

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APPENDIX I

Proposed BACT Limit for SO2

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BACT for SO_2 emissions resulting from combustion of kraft mill TRS emissions in the No. 1 and No. 2 combination boilers to comply with NSPS subpart BB is continued use of the LVHC collection system TRS scrubber. The proposed BACT limit for SO2 from the modified kraft pulping and evaporator systems is 385.2 tons per year.

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APPENDIX J

Air Dispersion Modeling Analysis

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Air Quality Modeling Analysis

1.0 Introduction

AbiBow US Inc. (AbiBow) manufactures coated paper and market pulp at their Catawba, South Carolina facility. This air dispersion modeling analysis was prepared in support of a Prevention of Significant Deterioration (PSD) permit application for a proposed kraft mill optimization project at the Catawba Mill. This PSD air dispersion modeling analysis describes the modeling methodologies that were utilized to complete air quality impact analyses associated with the PSD permit application.

This modeling analysis was conducted in a manner consistent with the approved Air Dispersion Modeling Protocol and follow-up discussions with SCDHEC and EPA, incorporating the most recent modeling guidance generally available at the time of submission.

1.1 Project Description

The optimization project will increase the yield from the kraft pulp mill using the same amount of raw materials (wood and cooking liquor) to produce more tons of pulp. A complete project description is provided in Section 2 of the PSD permit application.

1.2 PSD Applicability

AbiBow is considered a major stationary source under New Source Review (NSR) since it emits or has the potential to emit 100 tons per year or more of a regulated NSR pollutant as defined in SC Reg. 61-62.5, Standard No. 7. The proposed project is not considered major modification if it will not cause a "significant emissions increase" of a regulated pollutant as defined in Standard No. 7.

Based on the emission calculations from Section 4 of the PSD permit application, the pollutant sulfur dioxide (SO_2) will be subject to Prevention of Significant Deterioration (PSD) permitting requirements. Therefore, this is the only pollutant addressed in this PSD air dispersion modeling analysis.

1.3 South Carolina Standard No. 2, Standard No. 7, and Standard No. 8

The air dispersion modeling demonstration for South Carolina Standard No. 2, Standard No. 7, and Standard No. 8 pollutants for the Catawba Mill currently on file with SCDHEC is based on the maximum short-term emission rates for each source. The proposed modification does not increase the short-term emission rates previously modeled from any sources.

South Carolina Standard No. 2 does not currently require modeling for the 1-hour SO_2 and 1-hour NO_X standards. Since the project is not subject to PSD permitting requirements for $PM_{2.5}$ and previously modeled PM_{10} emissions from the Catawba Mill are not increasing as a result of the proposed modification, South Carolina does not require modeling $PM_{2.5}$ at this time. Therefore no additional modeling for South Carolina is required for this application.

2.0 AIR QUALITY IMPACT ANALYSIS

2.1 Area Description and Classification

The AbiBow Catawba Mill is located at 5300 Cureton Ferry Road in Catawba, South Carolina in York County. The approximate UTM coordinates are Zone 17, 510.014 km East, and 3,855.589 km North at an elevation of approximately 532.5 feet above mean sea level. The land-use within three kilometers of the facility is primarily forest and/or water surfaces. Therefore, the area is classified as rural for air dispersion modeling purposes. A U.S.G.S map showing the location of the facility and surrounding areas is provided in Attachment 1.

2.2 Air Dispersion Model Selection

URS perform the modeling analyses using the most recent version of the EPA preferred AERMOD computer dispersion model, Version 09292. AERMOD was used to model emissions to estimate concentrations at the mill fence line and beyond. The modeling analyses was performed using meteorological data to determine maximum concentrations and corresponding receptor locations for each modeled compound and respective averaging periods. The AERMOD modeling options that were used include the following:

- Calculation of average concentrations
- Regulatory default options
- Final plume rise

- Stack-tip downwash
- Buoyancy-induced dispersion
- Calms processing routine
- Default wind profile exponents
- Default vertical potential temperature gradients
- "Upper Bound" Values for supersquat buildings
- No exponential decay

2.3 Meteorological Data

A five (5) year meteorological data set was used to execute the air dispersion modeling analyses. The most recent, readily available five year meteorological data set (2002-2006) recommended by SCDHEC is Charlotte, NC surface meteorological data and Greensboro-High Point, NC, upper-air data.

The Charlotte/Douglas International Airport is located approximately 40 kilometers north of the Catawba Mill. The area surrounding the airport is gently rolling hills, similar to the area surrounding the Catawba Mill. The representativeness of the Charlotte meterological data for use at the Catawba Mill was qualitatively reviewed based on the surface roughness, Bowen ratio, and albedo of each location.

The surface roughness parameter is related to the obstructions to wind flow in the immediate vicinity (1-kilometer) of the measurement or modeling site. The meteorological tower at the airport is located in the vicinity of several aircraft hangars and warehouses, with the runways on the opposite sides of these structures some distance away. This is somewhat similar to the Catawba Mill, which also has large buildings on-site, as well as a large expanse of surface water some distance away from the main production area. Although the two sites have large buildings nearby, the surface roughness of airport sites is generally lower than industrial sites. At large airports like Charlotte/Douglas, with numerous large buildings and aircraft hangars on one side of the airport, and grass and trees on the other side of the airport, the surface roughness can vary significantly even within the airport boundaries.

The Bowen ratio and albedo are related to the land use patterns within ten kilometers of the measurement or modeling site. The land use in the eastern semi-circle from the airport is characterized by by mixed forest, industrial, and low intensity residential land uses, gradually becoming more dense toward Uptown Charlotte, located approximately 10 kilometers east of the airport. The western semi-circle is primariliy mixed forest land and Lake Wylie, with scatttered pockets of residentuial and industrial, but much less than the eastern semi-circle. The area surrounding the Catawba Mill is primarily mixed forest, evergreen forest, or agricultural land, with some water surface and some residential areas.

The differences in Bowen ratio and albedo between Charlotte/Douglas and the Catawba Mill are primarily related to the difference in agricultural and residential land uses. However, both locations have a large percentage of forest within 10 kilometers, and the surface roughness is probably a more significant difference between the two sites.

In order to address any potential concerns regarding the representativeness of the Charlotte/Douglas airport data, a second five (5) year meteorological data set was processed by SCDHEC using the surface characteristics of the area surrounding the Catawba Mill. The principle difference between the two sites is expected to be the surface roughness within 1 kilometer.

Both data sets were executed individually for each year and maximum predicted concentrations for the worst-case year was reported in the modeling results for comparison to the PSD Significant Impact Levels (SILs), PSD Significant Monitoring Concentrations (SMCs), NAAQS, and PSD increments.

2.4 Good Engineering Practice (GEP) Stack Height Analysis

GEP analysis was performed for all emission sources subject to modeling analysis in order to determine if wake effects and downwash options need to be selected in the computer model. The GEP analysis was performed using Version 4/21/04 of the EPA Building Profile Input Program for Plume Rise Model Enhancements (BPIPPRM). BPIPPRM is a PC-based program designed to incorporate the concepts and procedures expressed in the Good Engineering Practice (GEP) Technical Support Document, building downwash guidance, and other related references that correctly calculate building heights and projected building widths for simple, multi-tiered, and groups of structures in the AERMOD model.

2.5 Modeled Emission Rates

The source emissions inventory and stack parameters from the most recent complete modeling analysis for the mill (July 2006) was reviewed and updated to reflect current stack parameters and emission rates for all modeled sources and pollutants. For the significant impact area modeling, only the actual emissions increases from the proposed project was modeled.

The emission increase for PSD significant impact modeling purposes is based on the actual emissions prior to the change and the maximum emissions following the change. As mentioned previously, the maximum SO_2 emissions from the Catawba Mill are not increasing as a result of the project. For the annual averaging period the actual average emissions will be modeled, based on the average production during the baseline period. For the short-term averaging periods (1-hour, 3-hour, and 24-hour), EPA and SCDHEC allow using the maximum actual daily emissions, based on the highest daily production during the baseline period.

Attachment 2 contains the actual daily production rates during the baseline period for the kraft pulp mill (the only modified source of SO_2 emissions). Attachment 3 contains the emission calculations showing the annual and short-term increases in SO2 emissions due to the project.

2.6 Model Receptor Grid

The model receptor grid is similar to the grid in the July 2006 modeling analysis, and includes the AbiBow property line, the property of one neighboring facility and a railroad line crossing the property (both defined by EPA as ambient air), and off-site receptors. Property-line receptors were placed at approximately 50-meter intervals for the adjacent facility, the railroad line crossing the western side of the production area, and AbiBow's property line.

The off-site receptors are spaced at 100-meter intervals out to a distance of approximately 1 kilometer from the stacks, 250-meter intervals out to a distance of approximately 3 kilometers, and at 500-meter intervals out to approximately 7 kilometers. Terrain elevations for each receptor were determined from USGS topographic maps using AERMAP. In accordance with SCDHEC modeling guidelines, NED data required for calculation of base elevations in AERMOD was obtained from http://seamless.usgs.gov/website/seamless/viewer.htm.

The main production area at the Catawba Mill, which includes the powerhouse, was assigned a base elevation of 532.5 feet above mean sea-level based on the mill survey. The mill plot plan has been included in Attachment 4.

2.7 Model Source Groups

The sources with SO_2 emissions changing as a result of the proposed project were modeled for comparison to the significant impact levels and pre-construction monitoring exemption levels. The incineration of kraft pulp mill non-condensable gases (NCG's) in the two combination boilers at the Catawba Mill is the only source of SO_2 due to the proposed project. The previous air dispersion modeling analyses indicated that combination boiler No. 1 produces a slightly higher impact than combination boiler No.2. Therefore, the kraft mill NCG's were modeled from model source NETNCG1. The modeled stack parameters as well as the annual and short-term modeled emission rates are presented in Table 1.

Table 1
Stack Parameters and Emission Rates

Model Source	Model Number	SO_2 Emissions		Height		Diameter		Temperature		Flow Rate	
		lb/hr	tpy	ft	m	ft	m	°F	K	ft/sec	m/sec
Combination Boiler No. 1 – NCG Gases	NETNCG1	1.07	303.5	228	69.5	10	3.05	363.8	457.5	47.2	14.4

2.8 Significant Impact Area Modeling

The first phase of the modeling analysis involved determining if the proposed changes at the facility subject to PSD review will have a significant impact on air quality. This was determined by modeling the change in emissions of SO_2, the only PSD subject pollutant due to the proposed project.

Results of the significant impact modeling were then used to determine if NAAQS or PSD increment modeling is required. The predicted maximum concentrations for SO_2 were compared to the EPA significant impact levels (SIL's) for each averaging period to determine the significant impact area (SIA) for the proposed project. The SIA is the distance to the farthest model receptor with a significant impact.

The recently promulgated 1-hour SO_2 NAAQS does not have published SIL's. For the 1-hour averaging period, the SCDHEC interim SIL of 10 $\mu g/m^3$ and the EPA interim SIL of 3 ppb (7.8 $\mu g/m^3$) were considered.

As shown in Table 2, the significant impact levels were not exceeded at any receptor for any averaging period as a result of the proposed project. Therefore, the proposed project does not have a significant impact on air quality, and no further modeling demonstrations are required for the PSD permit application.

Table 2A
Significant Impact Analysis Results for Pollutant Sulfur Dioxide (SO_2)
Charlotte-Douglas Airport Pre-Processed MET Files

Year	Averaging Period	SIL	Maximum Concentration	Receptor Details				
				Easting [X]	Northing [Y]	Base Elevation	Hill	Date
		μg/m³	μg/m³	m	m	m	m	YYMMDDHH
2002	Annual	1.0	0.403	510200	3856200	163.43	163.43	
	1-Hour	7.8	0.270	510175	3855900	161.39	161.39	02042810
	3-Hour	25.0	0.166	510300	3856100	156.48	156.48	02042812
	24-Hour	5.0	0.046	510300	3856100	156.48	156.48	02042824
2003	Annual	1.0	0.330	510300	3856100	156.48	156.48	
	1-Hour	7.8	0.259	510175	3855900	161.39	161.39	03070614
	3-Hour	25.0	0.136	509600	3854857	147.97	147.97	03091712
	24-Hour	5.0	0.041	510500	3856500	156.65	156.65	03020324
2004	Annual	1.0	0.416	510200	3856100	161.41	168.05	
	1-Hour	7.8	0.219	510200	3856100	161.41	168.05	04010513
	3-Hour	25.0	0.125	509750	3854665	142.95	142.95	04111315
	24-Hour	5.0	0.037	509650	3854793	146.15	146.15	04091924
2005	Annual	1.0	0.357	509700	3854729	144.21	144.21	
	1-Hour	7.8	0.236	510125	3856000	162.33	162.33	05032811
	3-Hour	25.0	0.133	509650	3854793	146.15	146.15	05041612
	24-Hour	5.0	0.042	510200	3856100	161.41	168.05	05051424
2006	Annual	1.0	0.452	510300	3856100	156.48	156.48	
	1-Hour	7.8	0.243	510200	3855900	160.96	160.96	06111612
	3-Hour	25.0	0.155	510200	3856100	161.41	168.05	06040715
	24-Hour	5.0	0.049	510370	3855910	159.09	159.09	06061924

Table 2B
Significant Impact Analysis Results for Pollutant Sulfur Dioxide (SO_2)
Charlotte-Catawba Pre-Processed MET Files

Year	Averaging Period	SIL	Maximum Concentration	Receptor Details				
				Easting [X]	Northing [Y]	Base Elevation	Hill	Date
		µg/m^3	µg/m^3	m	m	m	m	YYMMDDHH
2002	Annual	1.0	0.519	510200	3856100	161.41	168.05	
	1-Hour	7.8	0.167	510175	3855900	161.39	161.39	02051711
	3-Hour	25.0	0.146	510150	3855950	161.02	161.02	02051712
	24-Hour	5.0	0.056	510300	3856100	156.48	156.48	02050924
2003	Annual	1.0	0.483	510200	3856100	161.41	168.05	
	1-Hour	7.8	0.161	509900	3854473	141.45	156.57	03090618
	3-Hour	25.0	0.145	510125	3856000	162.33	162.33	03072115
	24-Hour	5.0	0.053	510200	3856100	161.41	168.05	03072224
2004	Annual	1.0	0.551	510200	3856100	161.41	168.05	
	1-Hour	7.8	0.166	510150	3855950	161.02	161.02	04041913
	3-Hour	25.0	0.139	510175	3855900	161.39	161.39	04010315
	24-Hour	5.0	0.045	510200	3856100	161.41	168.05	04042124
2005	Annual	1.0	0.460	510200	3856100	161.41	168.05	
	1-Hour	7.8	0.168	509450	3855049	158.26	158.26	05101217
	3-Hour	25.0	0.144	510300	3855900	158.53	162.88	05012515
	24-Hour	5.0	0.054	510150	3855950	161.02	161.02	05051424
2006	Annual	1.0	0.607	510200	3856100	161.41	168.05	
	1-Hour	7.8	0.163	509500	3854985	152.56	152.56	06081613
	3-Hour	25.0	0.151	510200	3855900	160.96	160.96	06071312
	24-Hour	5.0	0.062	510200	3856100	161.41	168.05	06071324

2.9 Preconstruction Monitoring Exemption

Preconstruction ambient monitoring data may be required for each criteria compound subject to review under the PSD regulations if the maximum predicted concentration exceeds the PSD Ambient Monitoring Exemptions Levels. The maximum predicted concentrations are based on the results from the Significant Impact Analysis.

The maximum modeled SO_2 concentrations from the Significant Impact Analysis were compared to the PSD Monitoring Exemption Levels (significant monitoring concentrations) in Table 3 to determine if preconstruction monitoring data must be supplied.

Table 3
PSD Significant Monitoring Concentrations

Pollutant	Averaging Period	SMC $\mu g/m^3$	MET File Set	Impact $\mu g/m^3$
SO_2	24-HR	13.0	CLT/Douglas	0.049
			CLT/Catawba	0.062

The predicted maximum 24-hour SO_2 concentration from the SIA modeling is below the corresponding SMC. Therefore, preconstruction ambient monitoring data is not required for the proposed project.

3.0 Growth Impacts

The proposed changes to the facility will not result in any significant growth. The site has been operating for over forty years. The proposed modifications will not add to employment at the site. The increased kraft pulp production will not change the wood and chemical shipments to the facility, and market pulp shipments from the site will only increase slightly. However, since much of the market pulp is shipped by rail, the secondary emissions associated with shipments from the site are not expected to increase significantly. Therefore, no significant growth impacts are expected from the proposed project.

3.1 Soils and Vegetation Impacts

The proposed project is only subject to PSD review for SO_2. The modeled SO_2 emissions increase due to the proposed project has no significant impact (SIA = 0.0 km). Therefore, no significant impact on soils and vegetation is expected to result from the proposed project.

4.0 Class II Visibility Analysis

The proposed project is only subject to PSD review for SO_2. The modeled SO_2 emissions increase due to the proposed project has no significant impact (SIA = 0.0 km). Therefore, no significant impact on Class II visibility is expected to result from the proposed project.

5.0 PSD Class I Areas

The Catawba Mill is located within 200 kilometers of several PSD Class I areas. Each Class I Area within 200 kilometers was screened using the Q/D analysis recommended in FLAG2010 to determine the anticipated need for evaluating Air Quality Related Values (AQRV's).

The net emission increases from the proposed project are 124.8 tons per year (tpy) of SO_2, 15.8 tpy of NO_X, and 0.1 tpy of $PM_{2.5}$, for a total emissions increase of 140.7 tpy. Table 4 shows the total project emissions, the approximate distance to each Class I area within 200 km, and the calculated Q/D.

Table 4

AQRV Screening Criteria

Class I Area	Distance (km)	Total Project Emissions (tpy)	Q/D	Q/D Screening Level
Linville Gorge	140	140.7	1.0	10
Shining Rock	180	140.7	0.8	10
Great Smoky Mountains	216	140.7	0.7	10
Cape Romain	230	140.7	0.6	10

Although modeling for AQRVs is not anticipated based on FLAG2010, Class I Increment modeling was performed since the proposed project is subject to PSD requirements for SO_2.

The initial PSD Class I significant impact modeling used AERMOD with a special polar grid. The polar grid receptors were placed in an arc at a distance of 50 kilometers downwind in the direction of each Class I area along 1 degree radials. The maximum modeled concentration for each pollutant and averaging period was compared to Class I SILs to determine the need for additional modeling with CALPUFF.

As shown in Table 5, the predicted impacts from the proposed project at 50 kilometers downwind using AERMOD will not exceed the Class I SIL's at any Class I Areas. Based on these results, additional CALPUFF modeling would not be expected to produce significant impacts at any Class I Areas.

Table 5A
PSD Class I Area SO_2 Impacts
Charlotte-Douglas Airport Pre-Processed MET Files

Class I Area	Annual		3-hour		24-hour	
	SIL	Impact	SIL	Impact	SIL	Impact
	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
Cape Romain	0.1	0.0169	1.0	0.0112	0.2	0.0026
Great Smoky Mountains	0.1	0.0130	1.0	0.0185	0.2	0.0351
Linville Gorge	0.1	0.0130	1.0	0.0210	0.2	0.0039
Shining Rock	0.1	0.0105	1.0	0.0210	0.2	0.0039

* EPA has not established PSD Class I significant impact levels for the 1-hour averaging period.

Table 5
PSD Class I Area SO_2 Impacts
Charlotte-Catawba Pre-Processed MET Files

Class I Area	Annual		3-hour		24-hour	
	SIL	Impact	SIL	Impact	SIL	Impact
	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
Cape Romain	0.1	0.0128	1.0	0.0082	0.2	0.0021
Great Smoky Mountains	0.1	0.0117	1.0	0.0152	0.2	0.0028
Linville Gorge	0.1	0.0142	1.0	0.0152	0.2	0.0028
Shining Rock	0.1	0.0071	1.0	0.0152	0.2	0.0026

* EPA has not established PSD Class I significant impact levels for the 1-hour averaging period.

It should also be noted that in December 2005, a CALPUFF modeling analysis addressing AQRV's and Class I Increments for these Class I areas was submitted to SCDHEC and the appropriate Federal Land Managers in support of a PSD permit application. The 2005 PSD application was for project emission increases of 247 tpy of SO_2, 134 tpy of NO_X, and 44 tpy of PM_{10}. Although the Q/D criteria were not available in 2005, the Q/D value from the 2005 application for Linville Gorge would have been 3.0. The results of the 2005 CALPUFF modeling analyses indicated no significant impacts to any AQRV's or PSD Increments at

Linville Gorge, Shining Rock, or Cape Romain. A summary of the 2005 CALPUFF analysis is provided in Attachment 5.

In July 2006, CALPUFF modeling was again performed for the Catawba mill sources subject to the Best Available Retrofit Technology (BART) regulations. Although the modeled emission rates for the BART-eligible sources were much higher than the 2005 PSD modeling, these higher emissions did not cause or contribute to any visibility impairment at nearby Class I areas. A summary of the 2006 CALPUFF analysis is provided in Attachment 6.

9.0 Model Results

The AERMOD, BPIPPRM, and model input and output files for the modeling analysis will be provided on a disc(s). AERMOD will be re-executed and re-submitted if necessary when the newest version supporting the one-hour SO_2 standard is available from the modeling software vendor used for this analysis.

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Attachment 1

USGS MAP

AbiBow US Inc. – Catawba Operations

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Attachment 2
Daily Production Rates

Short-term (Daily) Production Rates			Short-term (Daily) Production Rates			Short-term (Daily) Production Rates		
DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD	DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD	DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD
12/1/07 12:00 PM	1,399	1,329	2/1/08 12:00 PM	1,462	1,389	4/1/08 12:00 PM	1,606	1,526
12/2/07 12:00 PM	1,618	1,537	2/2/08 12:00 PM	1,546	1,469	4/2/08 12:00 PM	1,643	1,561
12/3/07 12:00 PM	1,550	1,473	2/3/08 12:00 PM	1,592	1,512	4/3/08 12:00 PM	1,587	1,508
12/4/07 12:00 PM	1,720	1,634	2/4/08 12:00 PM	1,648	1,565	4/4/08 12:00 PM	1,559	1,481
12/5/07 12:00 PM	1,698	1,613	2/5/08 12:00 PM	1,660	1,577	4/5/08 12:00 PM	1,673	1,589
12/6/07 12:00 PM	1,619	1,538	2/6/08 12:00 PM	1,489	1,414	4/6/08 12:00 PM	1,719	1,633
12/7/07 12:00 PM	1,623	1,542	2/7/08 12:00 PM	1,557	1,479	4/7/08 12:00 PM	1,733	1,646
12/8/07 12:00 PM	1,599	1,519	2/8/08 12:00 PM	1,591	1,512	4/8/08 12:00 PM	1,698	1,613
12/9/07 12:00 PM	1,476	1,402	2/9/08 12:00 PM	1,464	1,391	4/9/08 12:00 PM	1,524	1,448
12/10/07 12:00 PM	1,655	1,572	2/10/08 12:00 PM	1,585	1,506	4/10/08 12:00 PM	1,658	1,575
12/11/07 12:00 PM	1,558	1,480	2/11/08 12:00 PM	1,434	1,362	4/11/08 12:00 PM	1,634	1,552
12/12/07 12:00 PM	1,694	1,610	2/12/08 12:00 PM	1,549	1,472	4/12/08 12:00 PM	1,567	1,489
12/13/07 12:00 PM	1,585	1,506	2/13/08 12:00 PM	1,085	1,031	4/13/08 12:00 PM	1,624	1,543
12/14/07 12:00 PM	1,152	1,094	2/14/08 12:00 PM	1,410	1,339	4/14/08 12:00 PM	1,320	1,254
12/15/07 12:00 PM	1,695	1,611	2/15/08 12:00 PM	1,638	1,556	4/15/08 12:00 PM	1,610	1,530
12/16/07 12:00 PM	1,763	1,675	2/16/08 12:00 PM	589	560	4/16/08 12:00 PM	1,512	1,436
12/17/07 12:00 PM	1,612	1,531	2/17/08 12:00 PM	1,602	1,522	4/17/08 12:00 PM	1,707	1,622
12/18/07 12:00 PM	1,574	1,495	2/18/08 12:00 PM	1,638	1,556	4/18/08 12:00 PM	1,682	1,598
12/19/07 12:00 PM	1,594	1,515	2/19/08 12:00 PM	1,666	1,583	4/19/08 12:00 PM	1,655	1,572
12/20/07 12:00 PM	1,175	1,116	2/20/08 12:00 PM	1,590	1,510	4/20/08 12:00 PM	1,691	1,607
12/21/07 12:00 PM	1,691	1,607	2/21/08 12:00 PM	1,593	1,514	4/21/08 12:00 PM	1,638	1,556
12/22/07 12:00 PM	1,444	1,372	2/22/08 12:00 PM	1,671	1,587	4/22/08 12:00 PM	1,642	1,560
12/23/07 12:00 PM	1,707	1,622	2/23/08 12:00 PM	1,599	1,519	4/23/08 12:00 PM	1,649	1,566
12/24/07 12:00 PM	1,711	1,626	2/24/08 12:00 PM	1,670	1,586	4/24/08 12:00 PM	486	461
12/25/07 12:00 PM	1,679	1,595	2/25/08 12:00 PM	1,680	1,596	4/25/08 12:00 PM	1,036	984
12/26/07 12:00 PM	1,344	1,277	2/26/08 12:00 PM	1,621	1,540	4/26/08 12:00 PM	1,624	1,543
12/27/07 12:00 PM	976	927	2/27/08 12:00 PM	1,597	1,517	4/27/08 12:00 PM	1,676	1,592
12/28/07 12:00 PM	1,248	1,185	2/28/08 12:00 PM	1,666	1,582	4/28/08 12:00 PM	1,489	1,414
12/29/07 12:00 PM	1,433	1,361	2/29/08 12:00 PM	1,592	1,512	4/29/08 12:00 PM	1,547	1,470
12/30/07 12:00 PM	1,671	1,588	3/1/08 12:00 PM	1,561	1,483	4/30/08 12:00 PM	1,676	1,593
12/31/07 12:00 PM	1,585	1,506	3/2/08 12:00 PM	1,655	1,572	5/1/08 12:00 PM	1,735	1,649
1/1/08 12:00 PM	1,504	1,429	3/3/08 12:00 PM	1,689	1,605	5/2/08 12:00 PM	1,655	1,572
1/2/08 12:00 PM	1,624	1,543	3/4/08 12:00 PM	1,604	1,524	5/3/08 12:00 PM	1,505	1,430
1/3/08 12:00 PM	1,551	1,474	3/5/08 12:00 PM	1,668	1,585	5/4/08 12:00 PM	1,739	1,652
1/4/08 12:00 PM	1,549	1,471	3/6/08 12:00 PM	1,726	1,640	5/5/08 12:00 PM	1,671	1,587
1/5/08 12:00 PM	1,086	1,032	3/7/08 12:00 PM	1,749	1,661	5/6/08 12:00 PM	1,671	1,588
1/6/08 12:00 PM	1,230	1,169	3/8/08 12:00 PM	1,708	1,622	5/7/08 12:00 PM	1,644	1,562
1/7/08 12:00 PM	1,673	1,589	3/9/08 12:00 PM	1,713	1,627	5/8/08 12:00 PM	1,654	1,571
1/8/08 12:00 PM	1,617	1,537	3/10/08 12:00 PM	1,695	1,610	5/9/08 12:00 PM	1,651	1,568
1/9/08 12:00 PM	1,607	1,527	3/11/08 12:00 PM	1,655	1,572	5/10/08 12:00 PM	1,622	1,541
1/10/08 12:00 PM	1,650	1,567	3/12/08 12:00 PM	1,679	1,595	5/11/08 12:00 PM	1,660	1,577
1/11/08 12:00 PM	1,661	1,578	3/13/08 12:00 PM	1,700	1,615	5/12/08 12:00 PM	1,600	1,520
1/12/08 12:00 PM	1,628	1,547	3/14/08 12:00 PM	1,736	1,650	5/13/08 12:00 PM	1,517	1,441
1/13/08 12:00 PM	1,605	1,525	3/15/08 12:00 PM	1,616	1,535	5/14/08 12:00 PM	1,487	1,413
1/14/08 12:00 PM	1,470	1,397	3/16/08 12:00 PM	1,669	1,585	5/15/08 12:00 PM	1,649	1,566
1/15/08 12:00 PM	1,644	1,562	3/17/08 12:00 PM	1,603	1,523	5/16/08 12:00 PM	1,771	1,683
1/16/08 12:00 PM	1,662	1,579	3/18/08 12:00 PM	1,642	1,559	5/17/08 12:00 PM	1,665	1,582
1/17/08 12:00 PM	1,554	1,476	3/19/08 12:00 PM	1,651	1,568	5/18/08 12:00 PM	1,693	1,609
1/18/08 12:00 PM	1,628	1,546	3/20/08 12:00 PM	1,659	1,576	5/19/08 12:00 PM	1,705	1,620
1/19/08 12:00 PM	1,645	1,562	3/21/08 12:00 PM	1,649	1,567	5/20/08 12:00 PM	1,534	1,457
1/20/08 12:00 PM	1,531	1,454	3/22/08 12:00 PM	0	0	5/21/08 12:00 PM	1,642	1,560
1/21/08 12:00 PM	1,541	1,464	3/23/08 12:00 PM	1,714	1,629	5/22/08 12:00 PM	1,665	1,582
1/22/08 12:00 PM	1,526	1,450	3/24/08 12:00 PM	1,725	1,639	5/23/08 12:00 PM	964	916
1/23/08 12:00 PM	1,317	1,252	3/25/08 12:00 PM	1,693	1,609	5/24/08 12:00 PM	1,095	1,040
1/24/08 12:00 PM	1,592	1,513	3/26/08 12:00 PM	1,642	1,559	5/25/08 12:00 PM	1,620	1,539
1/25/08 12:00 PM	1,675	1,591	3/27/08 12:00 PM	1,673	1,590	5/26/08 12:00 PM	1,645	1,563
1/26/08 12:00 PM	1,653	1,570	3/28/08 12:00 PM	1,696	1,611	5/27/08 12:00 PM	1,732	1,645
1/27/08 12:00 PM	1,516	1,440	3/29/08 12:00 PM	1,682	1,597	5/28/08 12:00 PM	1,732	1,645
1/28/08 12:00 PM	1,470	1,397	3/30/08 12:00 PM	1,683	1,599	5/29/08 12:00 PM	1,587	1,508
1/29/08 12:00 PM	1,411	1,340	3/31/08 12:00 PM	1,633	1,551	5/30/08 12:00 PM	1,687	1,603
1/30/08 12:00 PM	1,496	1,422				5/31/08 12:00 PM	1,617	1,536
1/31/08 12:00 PM	1,480	1,406						

Short-term (Daily) Production Rates

DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD
6/2/08 12:00 PM	1,768	1,680
6/3/08 12:00 PM	1,735	1,648
6/4/08 12:00 PM	1,689	1,604
6/5/08 12:00 PM	1,688	1,604
6/6/08 12:00 PM	1,688	1,604
6/7/08 12:00 PM	1,620	1,539
6/8/08 12:00 PM	1,525	1,449
6/9/08 12:00 PM	1,551	1,474
6/10/08 12:00 PM	1,583	1,504
6/11/08 12:00 PM	1,534	1,458
6/12/08 12:00 PM	1,694	1,609
6/13/08 12:00 PM	1,727	1,640
6/14/08 12:00 PM	0	0
6/15/08 12:00 PM	1,255	1,192
6/16/08 12:00 PM	1,663	1,580
6/17/08 12:00 PM	1,607	1,527
6/18/08 12:00 PM	1,626	1,544
6/19/08 12:00 PM	1,570	1,491
6/20/08 12:00 PM	1,609	1,528
6/21/08 12:00 PM	1,488	1,414
6/22/08 12:00 PM	1,715	1,629
6/23/08 12:00 PM	1,590	1,510
6/24/08 12:00 PM	1,671	1,588
6/25/08 12:00 PM	1,285	1,221
6/26/08 12:00 PM	0	0
6/27/08 12:00 PM	10	9
6/28/08 12:00 PM	785	745
6/29/08 12:00 PM	1,500	1,425
6/30/08 12:00 PM	1,637	1,555
7/1/08 12:00 PM	1,449	1,377
7/2/08 12:00 PM	1,432	1,361
7/3/08 12:00 PM	1,684	1,599
7/4/08 12:00 PM	1,764	1,676
7/5/08 12:00 PM	1,761	1,673
7/6/08 12:00 PM	1,725	1,639
7/7/08 12:00 PM	1,765	1,677
7/8/08 12:00 PM	1,696	1,611
7/9/08 12:00 PM	1,510	1,434
7/10/08 12:00 PM	1,564	1,486
7/11/08 12:00 PM	1,643	1,561
7/12/08 12:00 PM	1,592	1,512
7/13/08 12:00 PM	1,372	1,303
7/14/08 12:00 PM	0	0
7/15/08 12:00 PM	0	0
7/16/08 12:00 PM	0	0
7/17/08 12:00 PM	0	0
7/18/08 12:00 PM	0	0
7/19/08 12:00 PM	288	274
7/20/08 12:00 PM	1,224	1,163
7/21/08 12:00 PM	1,499	1,424
7/22/08 12:00 PM	1,661	1,578
7/23/08 12:00 PM	1,526	1,450
7/24/08 12:00 PM	1,760	1,672
7/25/08 12:00 PM	1,684	1,599
7/26/08 12:00 PM	1,645	1,562
7/27/08 12:00 PM	1,734	1,648
7/28/08 12:00 PM	1,752	1,664
7/29/08 12:00 PM	1,766	1,678
7/30/08 12:00 PM	1,771	1,683
7/31/08 12:00 PM	1,779	1,690

Short-term (Daily) Production Rates

DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD
8/1/08 12:00 PM	1,710	1,625
8/2/08 12:00 PM	1,745	1,658
8/3/08 12:00 PM	1,742	1,655
8/4/08 12:00 PM	1,723	1,636
8/5/08 12:00 PM	1,603	1,522
8/6/08 12:00 PM	1,711	1,626
8/7/08 12:00 PM	1,743	1,656
8/8/08 12:00 PM	1,550	1,472
8/9/08 12:00 PM	1,545	1,468
8/10/08 12:00 PM	1,786	1,697
8/11/08 12:00 PM	1,811	1,721
8/12/08 12:00 PM	1,796	1,706
8/13/08 12:00 PM	1,721	1,635
8/14/08 12:00 PM	1,732	1,646
8/15/08 12:00 PM	1,732	1,646
8/16/08 12:00 PM	1,628	1,546
8/17/08 12:00 PM	1,675	1,592
8/18/08 12:00 PM	1,682	1,598
8/19/08 12:00 PM	1,664	1,581
8/20/08 12:00 PM	1,686	1,601
8/21/08 12:00 PM	1,607	1,527
8/22/08 12:00 PM	1,702	1,616
8/23/08 12:00 PM	1,688	1,604
8/24/08 12:00 PM	1,621	1,540
8/25/08 12:00 PM	1,622	1,541
8/26/08 12:00 PM	1,594	1,514
8/27/08 12:00 PM	1,624	1,543
8/28/08 12:00 PM	1,625	1,544
8/29/08 12:00 PM	1,616	1,535
8/30/08 12:00 PM	1,784	1,694
8/31/08 12:00 PM	1,768	1,679
9/1/08 12:00 PM	1,647	1,564
9/2/08 12:00 PM	1,671	1,588
9/3/08 12:00 PM	1,640	1,558
9/4/08 12:00 PM	1,631	1,549
9/5/08 12:00 PM	1,534	1,457
9/6/08 12:00 PM	1,673	1,589
9/7/08 12:00 PM	1,684	1,600
9/8/08 12:00 PM	1,697	1,612
9/9/08 12:00 PM	1,623	1,541
9/10/08 12:00 PM	1,584	1,505
9/11/08 12:00 PM	1,637	1,555
9/12/08 12:00 PM	1,648	1,565
9/13/08 12:00 PM	1,581	1,502
9/14/08 12:00 PM	1,742	1,655
9/15/08 12:00 PM	1,746	1,659
9/16/08 12:00 PM	1,674	1,590
9/17/08 12:00 PM	1,635	1,553
9/18/08 12:00 PM	1,648	1,565
9/19/08 12:00 PM	1,621	1,540
9/20/08 12:00 PM	1,513	1,437
9/21/08 12:00 PM	1,657	1,574
9/22/08 12:00 PM	1,657	1,575
9/23/08 12:00 PM	1,657	1,574
9/24/08 12:00 PM	1,649	1,566
9/25/08 12:00 PM	1,602	1,522
9/26/08 12:00 PM	1,554	1,477
9/27/08 12:00 PM	1,703	1,618
9/28/08 12:00 PM	1,617	1,536
9/29/08 12:00 PM	1,650	1,568
9/30/08 12:00 PM	1,666	1,582

Short-term (Daily) Production Rates

DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD
10/1/08 12:00 PM	1,735	1,648
10/2/08 12:00 PM	1,801	1,711
10/3/08 12:00 PM	1,097	1,043
10/4/08 12:00 PM	1,756	1,668
10/5/08 12:00 PM	1,782	1,693
10/6/08 12:00 PM	1,816	1,725
10/7/08 12:00 PM	0	0
10/8/08 12:00 PM	1,589	1,510
10/9/08 12:00 PM	1,820	1,729
10/10/08 12:00 PM	1,821	1,729
10/11/08 12:00 PM	1,752	1,664
10/12/08 12:00 PM	1,622	1,541
10/13/08 12:00 PM	1,685	1,601
10/14/08 12:00 PM	1,601	1,521
10/15/08 12:00 PM	1,689	1,605
10/16/08 12:00 PM	1,772	1,683
10/17/08 12:00 PM	1,691	1,606
10/18/08 12:00 PM	1,650	1,568
10/19/08 12:00 PM	1,563	1,485
10/20/08 12:00 PM	1,711	1,626
10/21/08 12:00 PM	1,557	1,480
10/22/08 12:00 PM	1,664	1,581
10/23/08 12:00 PM	1,721	1,635
10/24/08 12:00 PM	1,546	1,469
10/25/08 12:00 PM	1,723	1,636
10/26/08 12:00 PM	1,691	1,607
10/27/08 12:00 PM	1,678	1,594
10/28/08 12:00 PM	1,651	1,569
10/29/08 12:00 PM	1,707	1,622
10/30/08 12:00 PM	1,627	1,546
10/31/08 12:00 PM	1,615	1,534
11/1/08 12:00 PM	1,614	1,533
11/2/08 12:00 PM	1,704	1,619
11/3/08 12:00 PM	1,637	1,556
11/4/08 12:00 PM	1,620	1,539
11/5/08 12:00 PM	1,590	1,510
11/6/08 12:00 PM	1,607	1,526
11/7/08 12:00 PM	1,546	1,469
11/8/08 12:00 PM	1,476	1,402
11/9/08 12:00 PM	1,612	1,531
11/10/08 12:00 PM	1,647	1,565
11/11/08 12:00 PM	1,583	1,504
11/12/08 12:00 PM	1,560	1,482
11/13/08 12:00 PM	1,714	1,628
11/14/08 12:00 PM	1,706	1,620
11/15/08 12:00 PM	1,651	1,568
11/16/08 12:00 PM	1,676	1,592
11/17/08 12:00 PM	1,710	1,624
11/18/08 12:00 PM	1,690	1,605
11/19/08 12:00 PM	1,612	1,531
11/20/08 12:00 PM	1,667	1,583
11/21/08 12:00 PM	1,511	1,435
11/22/08 12:00 PM	1,641	1,559
11/23/08 12:00 PM	1,640	1,558
11/24/08 12:00 PM	1,639	1,557
11/25/08 12:00 PM	1,646	1,564
11/26/08 12:00 PM	1,600	1,520
11/27/08 12:00 PM	1,503	1,428
11/28/08 12:00 PM	1,580	1,501
11/29/08 12:00 PM	1,619	1,538
11/30/08 12:00 PM	1,624	1,543

Short-term (Daily) Production Rates

DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD
12/1/08 12:00 PM	1,578	1,499
12/2/08 12:00 PM	1,645	1,563
12/3/08 12:00 PM	1,599	1,519
12/4/08 12:00 PM	1,016	965
12/5/08 12:00 PM	863	820
12/6/08 12:00 PM	863	820
12/7/08 12:00 PM	1,425	1,354
12/8/08 12:00 PM	1,585	1,506
12/9/08 12:00 PM	1,646	1,564
12/10/08 12:00 PM	1,556	1,478
12/11/08 12:00 PM	1,348	1,281
12/12/08 12:00 PM	1,316	1,250
12/13/08 12:00 PM	1,462	1,389
12/14/08 12:00 PM	1,515	1,439
12/15/08 12:00 PM	1,590	1,510
12/16/08 12:00 PM	1,600	1,520
12/17/08 12:00 PM	1,551	1,473
12/18/08 12:00 PM	1,533	1,457
12/19/08 12:00 PM	1,606	1,526
12/20/08 12:00 PM	1,629	1,547
12/21/08 12:00 PM	1,629	1,547
12/22/08 12:00 PM	1,612	1,532
12/23/08 12:00 PM	1,566	1,487
12/24/08 12:00 PM	579	550
12/25/08 12:00 PM	0	0
12/26/08 12:00 PM	0	0
12/27/08 12:00 PM	0	0
12/28/08 12:00 PM	0	0
12/29/08 12:00 PM	0	0
12/30/08 12:00 PM	0	0
12/31/08 12:00 PM	0	0
1/1/09 12:00 PM	0	0
1/2/09 12:00 PM	0	0
1/3/09 12:00 PM	0	0
1/4/09 12:00 PM	0	0
1/5/09 12:00 PM	726	690
1/6/09 12:00 PM	1,238	1,176
1/7/09 12:00 PM	1,090	1,036
1/8/09 12:00 PM	1,647	1,565
1/9/09 12:00 PM	1,618	1,537
1/10/09 12:00 PM	1,618	1,537
1/11/09 12:00 PM	1,566	1,488
1/12/09 12:00 PM	1,700	1,615
1/13/09 12:00 PM	1,707	1,622
1/14/09 12:00 PM	726	689
1/15/09 12:00 PM	1,729	1,642
1/16/09 12:00 PM	1,763	1,675
1/17/09 12:00 PM	1,699	1,614
1/18/09 12:00 PM	1,746	1,659
1/19/09 12:00 PM	1,748	1,661
1/20/09 12:00 PM	1,743	1,656
1/21/09 12:00 PM	1,649	1,567
1/22/09 12:00 PM	1,625	1,544
1/23/09 12:00 PM	1,621	1,540
1/24/09 12:00 PM	1,726	1,639
1/25/09 12:00 PM	1,761	1,673
1/26/09 12:00 PM	1,761	1,673
1/27/09 12:00 PM	1,760	1,672
1/28/09 12:00 PM	1,642	1,560
1/29/09 12:00 PM	1,693	1,609
1/30/09 12:00 PM	1,797	1,707
1/31/09 12:00 PM	1,752	1,664

Short-term (Daily) Production Rates

DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD
2/1/09 12:00 PM	1,404	1,334
2/2/09 12:00 PM	1,692	1,608
2/3/09 12:00 PM	1,105	1,049
2/4/09 12:00 PM	0	0
2/5/09 12:00 PM	0	0
2/6/09 12:00 PM	0	0
2/7/09 12:00 PM	0	0
2/8/09 12:00 PM	0	0
2/9/09 12:00 PM	0	0
2/10/09 12:00 PM	0	0
2/11/09 12:00 PM	603	572
2/12/09 12:00 PM	1,555	1,477
2/13/09 12:00 PM	1,394	1,324
2/14/09 12:00 PM	1,612	1,531
2/15/09 12:00 PM	1,669	1,586
2/16/09 12:00 PM	1,694	1,610
2/17/09 12:00 PM	1,646	1,563
2/18/09 12:00 PM	1,659	1,576
2/19/09 12:00 PM	1,459	1,386
2/20/09 12:00 PM	1,676	1,593
2/21/09 12:00 PM	1,671	1,587
2/22/09 12:00 PM	1,697	1,612
2/23/09 12:00 PM	1,698	1,613
2/24/09 12:00 PM	1,727	1,641
2/25/09 12:00 PM	1,173	1,114
2/26/09 12:00 PM	1,651	1,569
2/27/09 12:00 PM	1,716	1,630
2/28/09 12:00 PM	1,439	1,367
3/1/09 12:00 PM	1,009	959
3/2/09 12:00 PM	1,012	961
3/3/09 12:00 PM	823	782
3/4/09 12:00 PM	976	927
3/5/09 12:00 PM	1,285	1,220
3/6/09 12:00 PM	1,556	1,478
3/7/09 12:00 PM	1,486	1,411
3/8/09 12:00 PM	1,560	1,482
3/9/09 12:00 PM	1,632	1,550
3/10/09 12:00 PM	1,635	1,553
3/11/09 12:00 PM	1,390	1,320
3/12/09 12:00 PM	1,188	1,129
3/13/09 12:00 PM	1,458	1,385
3/14/09 12:00 PM	1,569	1,491
3/15/09 12:00 PM	1,621	1,540
3/16/09 12:00 PM	1,617	1,537
3/17/09 12:00 PM	1,366	1,298
3/18/09 12:00 PM	1,398	1,328
3/19/09 12:00 PM	1,671	1,588
3/20/09 12:00 PM	1,658	1,575
3/21/09 12:00 PM	1,641	1,559
3/22/09 12:00 PM	1,562	1,484
3/23/09 12:00 PM	1,560	1,482
3/24/09 12:00 PM	1,560	1,482
3/25/09 12:00 PM	1,468	1,394
3/26/09 12:00 PM	1,626	1,545
3/27/09 12:00 PM	1,594	1,515
3/28/09 12:00 PM	1,625	1,544
3/29/09 12:00 PM	1,622	1,541
3/30/09 12:00 PM	1,544	1,467
3/31/09 12:00 PM	1,675	1,591

Short-term (Daily) Production Rates

DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD
4/1/09 12:00 PM	1,344	1,277
4/2/09 12:00 PM	1,651	1,569
4/3/09 12:00 PM	1,651	1,568
4/4/09 12:00 PM	1,392	1,322
4/5/09 12:00 PM	1,240	1,178
4/6/09 12:00 PM	1,779	1,691
4/7/09 12:00 PM	1,637	1,555
4/8/09 12:00 PM	1,774	1,686
4/9/09 12:00 PM	1,815	1,724
4/10/09 12:00 PM	1,811	1,721
4/11/09 12:00 PM	1,599	1,519
4/12/09 12:00 PM	1,623	1,542
4/13/09 12:00 PM	1,600	1,520
4/14/09 12:00 PM	1,743	1,656
4/15/09 12:00 PM	1,766	1,677
4/16/09 12:00 PM	1,564	1,486
4/17/09 12:00 PM	1,387	1,318
4/18/09 12:00 PM	1,594	1,514
4/19/09 12:00 PM	1,585	1,506
4/20/09 12:00 PM	1,707	1,622
4/21/09 12:00 PM	1,739	1,652
4/22/09 12:00 PM	1,649	1,566
4/23/09 12:00 PM	1,600	1,520
4/24/09 12:00 PM	1,693	1,609
4/25/09 12:00 PM	1,615	1,534
4/26/09 12:00 PM	1,714	1,628
4/27/09 12:00 PM	1,738	1,652
4/28/09 12:00 PM	1,469	1,396
4/29/09 12:00 PM	1,754	1,667
4/30/09 12:00 PM	1,662	1,579
5/1/09 12:00 PM	1,605	1,525
5/2/09 12:00 PM	1,669	1,586
5/3/09 12:00 PM	976	927
5/4/09 12:00 PM	888	843
5/5/09 12:00 PM	1,571	1,493
5/6/09 12:00 PM	1,455	1,382
5/7/09 12:00 PM	1,708	1,623
5/8/09 12:00 PM	1,714	1,628
5/9/09 12:00 PM	1,642	1,560
5/10/09 12:00 PM	1,655	1,573
5/11/09 12:00 PM	1,642	1,560
5/12/09 12:00 PM	1,635	1,554
5/13/09 12:00 PM	1,621	1,540
5/14/09 12:00 PM	1,480	1,406
5/15/09 12:00 PM	1,401	1,331
5/16/09 12:00 PM	1,555	1,477
5/17/09 12:00 PM	1,704	1,619
5/18/09 12:00 PM	1,685	1,601
5/19/09 12:00 PM	1,682	1,598
5/20/09 12:00 PM	1,540	1,463
5/21/09 12:00 PM	1,644	1,561
5/22/09 12:00 PM	1,591	1,512
5/23/09 12:00 PM	1,352	1,284
5/24/09 12:00 PM	1,301	1,236
5/25/09 12:00 PM	1,568	1,489
5/26/09 12:00 PM	1,636	1,554
5/27/09 12:00 PM	1,671	1,587
5/28/09 12:00 PM	1,690	1,605
5/29/09 12:00 PM	1,662	1,579
5/30/09 12:00 PM	1,667	1,584
5/31/09 12:00 PM	1,675	1,591

Short-term (Daily) Production Rates **Short-term (Daily) Production Rates** **Short-term (Daily) Production Rates**

DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD	DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD	DATE	Kraft Pulp Production TPD	Bleached Pulp Production TPD
6/1/09 12:00 PM	1,694	1,609	8/1/09 12:00 PM	1,670	1,587	10/1/09 12:00 PM	1,676	1,592
6/2/09 12:00 PM	1,666	1,583	8/2/09 12:00 PM	1,637	1,555	10/2/09 12:00 PM	1,745	1,658
6/3/09 12:00 PM	1,677	1,594	8/3/09 12:00 PM	1,618	1,537	10/3/09 12:00 PM	1,656	1,573
6/4/09 12:00 PM	1,620	1,539	8/4/09 12:00 PM	1,442	1,370	10/4/09 12:00 PM	1,686	1,602
6/5/09 12:00 PM	1,694	1,609	8/5/09 12:00 PM	1,762	1,674	10/5/09 12:00 PM	1,423	1,352
6/6/09 12:00 PM	1,697	1,612	8/6/09 12:00 PM	1,744	1,657	10/6/09 12:00 PM	1,470	1,396
6/7/09 12:00 PM	1,658	1,575	8/7/09 12:00 PM	1,679	1,595	10/7/09 12:00 PM	1,728	1,642
6/8/09 12:00 PM	1,588	1,509	8/8/09 12:00 PM	1,690	1,605	10/8/09 12:00 PM	1,720	1,634
6/9/09 12:00 PM	1,553	1,475	8/9/09 12:00 PM	1,713	1,627	10/9/09 12:00 PM	1,738	1,651
6/10/09 12:00 PM	1,693	1,608	8/10/09 12:00 PM	311	295	10/10/09 12:00 PM	1,034	983
6/11/09 12:00 PM	1,728	1,641	8/11/09 12:00 PM	1,047	994	10/11/09 12:00 PM	1,591	1,512
6/12/09 12:00 PM	1,689	1,605	8/12/09 12:00 PM	1,685	1,601	10/12/09 12:00 PM	1,615	1,534
6/13/09 12:00 PM	1,624	1,542	8/13/09 12:00 PM	1,782	1,693	10/13/09 12:00 PM	1,702	1,617
6/14/09 12:00 PM	1,606	1,526	8/14/09 12:00 PM	1,787	1,697	10/14/09 12:00 PM	1,655	1,572
6/15/09 12:00 PM	1,645	1,563	8/15/09 12:00 PM	1,702	1,617	10/15/09 12:00 PM	1,638	1,556
6/16/09 12:00 PM	1,658	1,575	8/16/09 12:00 PM	1,725	1,639	10/16/09 12:00 PM	1,644	1,562
6/17/09 12:00 PM	1,707	1,622	8/17/09 12:00 PM	1,751	1,664	10/17/09 12:00 PM	1,518	1,442
6/18/09 12:00 PM	1,643	1,561	8/18/09 12:00 PM	1,767	1,679	10/18/09 12:00 PM	1,636	1,554
6/19/09 12:00 PM	1,709	1,624	8/19/09 12:00 PM	1,767	1,679	10/19/09 12:00 PM	1,577	1,498
6/20/09 12:00 PM	1,509	1,433	8/20/09 12:00 PM	1,770	1,681	10/20/09 12:00 PM	1,483	1,409
6/21/09 12:00 PM	1,098	1,043	8/21/09 12:00 PM	1,093	1,039	10/21/09 12:00 PM	1,635	1,554
6/22/09 12:00 PM	1,653	1,570	8/22/09 12:00 PM	1,724	1,638	10/22/09 12:00 PM	1,615	1,534
6/23/09 12:00 PM	1,680	1,596	8/23/09 12:00 PM	1,659	1,576	10/23/09 12:00 PM	1,659	1,576
6/24/09 12:00 PM	1,632	1,551	8/24/09 12:00 PM	1,761	1,673	10/24/09 12:00 PM	1,565	1,487
6/25/09 12:00 PM	1,686	1,601	8/25/09 12:00 PM	1,595	1,515	10/25/09 12:00 PM	1,699	1,614
6/26/09 12:00 PM	1,564	1,486	8/26/09 12:00 PM	1,582	1,503	10/26/09 12:00 PM	1,646	1,564
6/27/09 12:00 PM	1,596	1,516	8/27/09 12:00 PM	1,768	1,680	10/27/09 12:00 PM	1,646	1,564
6/28/09 12:00 PM	1,617	1,536	8/28/09 12:00 PM	1,737	1,650	10/28/09 12:00 PM	1,627	1,546
6/29/09 12:00 PM	1,629	1,547	8/29/09 12:00 PM	1,707	1,621	10/29/09 12:00 PM	1,627	1,546
6/30/09 12:00 PM	1,634	1,552	8/30/09 12:00 PM	1,740	1,653	10/30/09 12:00 PM	1,628	1,546
7/1/09 12:00 PM	1,137	1,080	8/31/09 12:00 PM	1,648	1,566	10/31/09 12:00 PM	1,648	1,566
7/2/09 12:00 PM	1,552	1,475	9/1/09 12:00 PM	1,750	1,663	11/1/09 12:00 PM	1,759	1,671
7/3/09 12:00 PM	1,638	1,556	9/2/09 12:00 PM	1,705	1,620	11/2/09 12:00 PM	792	753
7/4/09 12:00 PM	1,640	1,558	9/3/09 12:00 PM	1,683	1,599	11/3/09 12:00 PM	1,403	1,333
7/5/09 12:00 PM	1,650	1,568	9/4/09 12:00 PM	1,593	1,513	11/4/09 12:00 PM	1,514	1,438
7/6/09 12:00 PM	1,666	1,583	9/5/09 12:00 PM	1,655	1,572	11/5/09 12:00 PM	1,717	1,631
7/7/09 12:00 PM	1,661	1,578	9/6/09 12:00 PM	1,723	1,637	11/6/09 12:00 PM	1,714	1,628
7/8/09 12:00 PM	1,656	1,573	9/7/09 12:00 PM	1,730	1,643	11/7/09 12:00 PM	1,599	1,519
7/9/09 12:00 PM	1,657	1,574	9/8/09 12:00 PM	1,727	1,640	11/8/09 12:00 PM	1,552	1,475
7/10/09 12:00 PM	1,686	1,602	9/9/09 12:00 PM	1,684	1,600	11/9/09 12:00 PM	1,690	1,606
7/11/09 12:00 PM	1,686	1,602	9/10/09 12:00 PM	1,714	1,628	11/10/09 12:00 PM	1,636	1,554
7/12/09 12:00 PM	1,716	1,630	9/11/09 12:00 PM	1,718	1,632	11/11/09 12:00 PM	1,693	1,609
7/13/09 12:00 PM	1,689	1,604	9/12/09 12:00 PM	1,718	1,632	11/12/09 12:00 PM	1,714	1,628
7/14/09 12:00 PM	1,708	1,622	9/13/09 12:00 PM	1,718	1,632	11/13/09 12:00 PM	1,693	1,609
7/15/09 12:00 PM	1,689	1,605	9/14/09 12:00 PM	1,718	1,632	11/14/09 12:00 PM	1,690	1,606
7/16/09 12:00 PM	1,675	1,592	9/15/09 12:00 PM	1,718	1,632	11/15/09 12:00 PM	1,630	1,549
7/17/09 12:00 PM	1,652	1,569	9/16/09 12:00 PM	1,713	1,628	11/16/09 12:00 PM	1,660	1,577
7/18/09 12:00 PM	1,665	1,582	9/17/09 12:00 PM	1,680	1,596	11/17/09 12:00 PM	1,686	1,601
7/19/09 12:00 PM	1,327	1,261	9/18/09 12:00 PM	1,703	1,618	11/18/09 12:00 PM	1,573	1,495
7/20/09 12:00 PM	1,203	1,143	9/19/09 12:00 PM	1,703	1,618	11/19/09 12:00 PM	1,612	1,531
7/21/09 12:00 PM	614	583	9/20/09 12:00 PM	1,703	1,618	11/20/09 12:00 PM	1,671	1,588
7/22/09 12:00 PM	1,313	1,247	9/21/09 12:00 PM	1,720	1,634	11/21/09 12:00 PM	1,657	1,574
7/23/09 12:00 PM	1,345	1,278	9/22/09 12:00 PM	1,760	1,672	11/22/09 12:00 PM	1,616	1,535
7/24/09 12:00 PM	1,322	1,256	9/23/09 12:00 PM	1,665	1,581	11/23/09 12:00 PM	1,645	1,563
7/25/09 12:00 PM	1,635	1,553	9/24/09 12:00 PM	1,698	1,613	11/24/09 12:00 PM	1,125	1,069
7/26/09 12:00 PM	1,659	1,576	9/25/09 12:00 PM	1,698	1,613	11/25/09 12:00 PM	823	782
7/27/09 12:00 PM	1,666	1,583	9/26/09 12:00 PM	1,722	1,636	11/26/09 12:00 PM	1,420	1,349
7/28/09 12:00 PM	1,666	1,583	9/27/09 12:00 PM	1,743	1,656	11/27/09 12:00 PM	1,651	1,569
7/29/09 12:00 PM	1,602	1,522	9/28/09 12:00 PM	1,724	1,637	11/28/09 12:00 PM	1,651	1,569
7/30/09 12:00 PM	1,646	1,564	9/29/09 12:00 PM	1,702	1,617	11/29/09 12:00 PM	816	775
7/31/09 12:00 PM	1,612	1,532	9/30/09 12:00 PM	1,659	1,576	11/30/09 12:00 PM	891	846
						MAXIMUM	**1,820.5**	**1,729.5**

Attachment 3

Model Emission Rates

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Summary		1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABLITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide					432.34	431.27	1.07	1,893.64	1,590.13	303.50
Total Reduced Sulfur (as Sulfur)					3.83	3.82	0.01	16.78	14.09	2.69

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Digester Chip Bin	5210	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABLITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	3.0E-01	#/ADTP	E, I	0.675	15.40	15.36	0.04	67.45	56.64	10.81
Total Reduced Sulfur (as Sulfur)	1.5E-01	#/ADTP	A	0.01	0.11	0.11	0.00	0.50	0.42	0.08

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 9H - Continuous Digester.
B) Emission factors from New Fiberline PSD Permit Application
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:
Projected production from PSD construction permit DA.
Maximum production is highest daily production from December 2007 through November 2009
Average production is average daily production from December 2007 through November 2009
Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Digester Relief Gas	5210	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABLITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	8.4E-02	#/ADTP	E, I	0.675	4.31	4.30	0.01	18.88	15.86	3.03
Total Reduced Sulfur (as Sulfur)	4.2E-02	#/ADTP	A	0.01	0.03	0.03	0.00	0.14	0.12	0.02

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 9A - Continuous Digester.
B) Emission factor adjusted from total VOC to VOC as carbon based on molecular weight of predominate VOC species.
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:
Projected production from PSD construction permit DA.
Maximum production is highest daily production from December 2007 through November 2009
Average production is average daily production from December 2007 through November 2009
Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Digester Blow Tank	5210	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	3.8E-02	#/ADTP	E, I	0.675	1.95	1.95	0.00	8.54	7.17	1.37
Total Reduced Sulfur (as Sulfur)	1.9E-02	#/ADTP	A	0.01	0.01	0.01	0.00	0.06	0.05	0.01

REFERENCES:

A) Median emission factors from NCASI Technical Bulletin No. 858, Table 9B - Continuous Digester.

B) Emission factors from New Fiberline PSD Permit Application

E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:

Projected production from PSD construction permit DA.

Maximum production is highest daily production from December 2007 through November 2009

Average production is average daily production from December 2007 through November 2009

Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.

Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
raft Pulping NCG System - Pressure Diffusion Wash	5230	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	7.2E-02	#/ADTP	E, I	0.675	3.70	3.69	0.01	16.19	13.59	2.59
Total Reduced Sulfur (as Sulfur)	3.6E-02	#/ADTP	A	0.01	0.03	0.03	0.00	0.12	0.10	0.02

REFERENCES:

A) Median emission factors from NCASI Technical Bulletin No. 858, Table 7 - non-vacuum drum washers.

B) Emission factors from New Fiberline PSD Permit Application

E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:

Projected production from PSD construction permit DA.

Maximum production is highest daily production from December 2007 through November 2009

Average production is average daily production from December 2007 through November 2009

Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.

Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Knotters	5250	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	2.6E-03	#/ADTP	E, I	0.675	0.13	0.13	0.00	0.58	0.49	0.09
Total Reduced Sulfur (as Sulfur)	1.3E-03	#/ADTP	A	0.01	0.00	0.00	0.00	0.00	0.00	0.00

REFERENCES:

A) Median emission factors from NCASI Technical Bulletin No. 858, Table 4.

B) Emission factors from New Fiberline PSD Permit Application

E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.

I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:

Projected production from PSD construction permit DA.

Maximum production is highest daily production from December 2007 through November 2009

Average production is average daily production from December 2007 through November 2009

Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.

Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Screens	5250	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABLITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	1.8E-03	#/ADTP	E, I	0.675	0.09	0.09	0.00	0.40	0.34	0.06
Total Reduced Sulfur (as Sulfur)	9.0E-04	#/ADTP	A	0.01	0.00	0.00	0.00	0.00	0.00	0.00

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 5.
B) Emission factors from New Fiberline PSD Permit Application
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:
Projected production from PSD construction permit DA.
Maximum production is highest daily production from December 2007 through November 2009
Average production is average daily production from December 2007 through November 2009
Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Decker	5250	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABLITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	7.0E-02	#/ADTP	E, I	0.675	3.59	3.58	0.01	15.74	13.21	2.52
Total Reduced Sulfur (as Sulfur)	3.5E-02	#/ADTP	A	0.01	0.03	0.03	0.00	0.12	0.10	0.02

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 8.
B) Emission factors from New Fiberline PSD Permit Application
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:
Projected production from PSD construction permit DA.
Maximum production is highest daily production from December 2007 through November 2009
Average production is average daily production from December 2007 through November 2009
Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Oxygen Delignification	5240	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABLITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	1.2E-02	#/ADTP	E, I	0.675	0.60	0.59	0.00	2.61	2.19	0.42
Total Reduced Sulfur (as Sulfur)	5.8E-03	#/ADTP	A	0.01	0.00	0.00	0.00	0.02	0.02	0.00

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 3.
B) Emission factors from New Fiberline PSD Permit Application
E) Assumed 100% conversion of TRS (as S) to SO2 in Combination Boiler.
I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:
Projected production from PSD construction permit DA.
Maximum production is highest daily production from December 2007 through November 2009
Average production is average daily production from December 2007 through November 2009
Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction (32.5%) due to sulfur capture by wood ash in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Turpentine Recovery	5220	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	6.0E-03	#/ADTP	E, I	0.3375	0.15	0.15	0.00	0.67	0.57	0.11
Total Reduced Sulfur (as Sulfur)	3.0E-03	#/ADTP	A	0.01	0.00	0.00	0.00	0.01	0.01	0.00

REFERENCES:
A) Median emission factors from NCASI Technical Bulletin No. 858, Table 9I.
B) Emission factor adjusted from total VOC to VOC as carbon based on molecular weight of predominate VOC species.
E) Assumed 50% removal of TRS in LVHC system scrubber and 100% conversion of TRS into SO2.
I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:
Projected production from PSD construction permit DA.
Maximum production is highest daily production from December 2007 through November 2009
Average production is average daily production from December 2007 through November 2009
Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction due to LVHC scrubber (50%) and sulfur capture by wood ash (32.5%) in combination boilers.

PROCESS EMISSION SOURCE	TITLE V UNIT ID	PROJECTED PRODUCTION	MAXIMUM PRODUCTION	AVERAGE PRODUCTION	PRODUCTION UNITS
Kraft Pulping NCG System - Evaporator System	2400	1,825.0	1,820.5	1,532.5	ADTP/Day

	EMISSION FACTOR INFORMATION			PROCESS VARIABILITY	PROJECTED EMISSIONS	MAXIMUM EMISSIONS	EMISSION INCREASE	PROJECTED EMISSIONS	AVERAGE EMISSIONS	EMISSION INCREASE
POLLUTANT	FACTOR	UNITS	NOTE	FACTOR	(lb/hr)	(lb/hr)	(lb/hr)	(tons/yr)	(tons/yr)	(tpy)
Sulfur dioxide	3.28E+00	#/ADTP	E, I	0.3375	84.18	83.97	0.21	368.70	309.61	59.09
Total Reduced Sulfur (as Sulfur)	1.64E+00	#/ADTP	B	0.01	1.25	1.25	0.00	5.48	4.60	0.88

REFERENCES:
A) Emission factors from NCASI Technical Bulletin 858, Table 9C - Evaporators at Mills with Continuous Digesters.
B) Emission factors based on Bowater source testing September 11, 1996.
E) Assumed 50% removal of TRS in LVHC system scrubber and 100% conversion of TRS into SO2.
I) Assumed 32.5% sulfur capture in combination boiler wood ashes per NCASI TB 640, Figure 11.

NOTES:
Projected production from PSD construction permit DA.
Maximum production is highest daily production from December 2007 through November 2009
Average production is average daily production from December 2007 through November 2009
Process variablity factors for TRS reflect assumed minimum percent reduction (99%) due to NCG combustion in combination boilers.
Process variablity factor for SO2 reflects assumed minimum percent reduction due to LVHC scrubber (50%) and sulfur capture by wood ash (32.5%) in combination boilers.

Attachment 5

CALPUFF Modeling Summary
December 2005

Class I Area Modeling Results:

A Class I analysis was performed to determine the facility's impact on two Class I areas, namely, the Linville Gorge and Shining Rock Forest Service Wilderness Areas. The Class I analysis was conducted using the CALPUFF model in a refine mode based on modeling procedures discussed in a September, 2005 modeling protocol prepared by URS Corporation and written comments on the protocol provided by the Forest Service in a letter to the South Carolina Department of Health and Environmental Control dated November 17, 2005. A copy of the letter from the Forest Service is presented in Appendix E.

The results of the CALPUFF modeling analysis are summarized in Table 6. As shown, the predicted air quality impacts for deposition, regional haze and pollutant concentration are well below the applicable regulatory threshold values. Based upon results from this refined level CALPUFF modeling analysis, no adverse air quality impacts are predicted to occur in either Class I area. Consequently, no further Class I area analyses are required and this component of the PSD application submittal is complete.

Table 6. Bowater Class I Modeling Results for Linville Gorge and Shining Rock

Total Nitrogen Deposition

Year	1986	1987	1988	1989	1990	Threshold	Unit
Results	0.00037	0.00032	0.00016	0.00024	**0.00039**	0.01	kg/ha/yr

Total Sulfur Deposition

Year	1986	1987	1988	1989	1990	Threshold	Units
Results	0.00110	**0.00119**	0.00051	0.00080	0.00113	0.01	kg/ha/yr

Regional Haze

Year	1986	> 5%	1987	> 5%	1988	> 5%	1989	> 5%	1990	> 5%	Threshold	Unit
Results	**1.74**	0	1.46	0	0.65	0	0.59	0	1.36	0	5	%Chg

SO_2 Increment

Year	1986	1987	1988	1989	1990	Threshold	Units
Annual	**0.0007**	0.0007	0.0004	0.0006	0.0007	0.1	ug/m^3
24-Hour	0.04	**0.07**	0.03	0.02	0.05	0.2	ug/m^3
3-Hour	0.12	**0.27**	0.10	0.07	0.22	1	ug/m^3

PM_{10} Increment

Year	1986	1987	1988	1989	1990	Threshold	Units
Annual	**0.0002**	0.0002	0.0001	0.0001	0.0002	0.2	ug/m^3
24-Hour	0.01	**0.02**	0.01	0.01	0.01	0.3	ug/m^3

NO_2 Increment

Year	1986	1987	1988	1989	1990	Threshold	Units
Annual	0.0001	0.0002	0.0001	0.0001	**0.0002**	0.1	ug/m^3

Breakout by Class I Area for Parameter of Greatest Concern (Regional Haze)

Linville Gorge

Year	1986	> 5%	1987	> 5%	1988	> 5%	1989	> 5%	1990	> 5%	Threshold	Unit
Results	**1.74**	0	1.46	0	0.73	0	0.62	0	1.36	0	5	%Chg

Shining Rock

Year	1986	> 5%	1987	> 5%	1988	> 5%	1989	> 5%	1990	> 5%	Threshold	Unit
Results	0.21	0	0.60	0	0.73	0	0.62	0	0.37	0	5	%Chg

All meteorological and atmospheric modeling files associated with this analysis are being supplied in electronic format to SCDEC and the U.S. Forest Service.

Table 6. Bowater Class I Modeling Results for Cape Romain.

Total Nitrogen Deposition

Year	1987	1988	1989	1990	1991	Threshold	Unit
Results	0.0006	0.0006	**0.0006**	0.0005	0.0005	0.01	kg/ha/yr

Total Sulfur Deposition

Year	1987	1988	1989	1990	1991	Threshold	Units
Results	0.0014	0.0012	**0.0015**	0.0013	0.0010	0.01	kg/ha/yr

SO_2 Increment

Year	1987	1988	1989	1990	1991	Threshold	Units
Annual	0.0011	0.0009	**0.0012**	0.0012	0.0010	0.1	ug/m^3
24-Hour	**0.033**	0.021	0.022	0.025	0.027	0.2	ug/m^3
3-Hour	0.080	0.070	0.059	**0.082**	0.052	1	ug/m^3

PM_{10} Increment

Year	1987	1988	1989	1990	1991	Threshold	Units
Annual	0.00034	0.00030	**0.00042**	0.00040	0.00031	0.2	ug/m^3
24-Hour	**0.0104**	0.0067	0.0071	0.0076	0.0063	0.3	ug/m^3

NO_2 Increment

Year	1987	1988	1989	1990	1991	Threshold	Units
Annual	0.00004	0.00005	**0.00006**	0.00005	0.00005	0.1	ug/m^3

Regional Haze

Year	1987	> 5%	1988	> 5%	1989	> 5%	1990	> 5%	1991	> 5%	Threshold	Unit
Results	**2.16**	0	1.87	0	1.73	0	1.62	0	1.40	0	5	%Chg

All meteorological and atmospheric modeling files associated with this analysis are being supplied in electronic format to SCDEC and the U.S. Fish and Wildlife Service.

Attachment 6

CALPUFF Modeling Summary
July 2006

7.1 CALPUFF Modeling Results

The CALPUFF modeling results are summarized in Tables 7-1 and 7-2. The format of the tables was taken directly from the VISTAS common protocol. The modeling results clearly indicate that the Bowater BART eligible units do not cause or contribute to any visibility impairment in any of the nearby Class I areas. Therefore, based on the modeling information and results presented in this report, Bowater requests that the SCDHEC review this modeling submittal for completeness and respond with a letter stating that the Bowater facility is exempt from any additional BART regulatory requirements.

Included with this report is a CD that includes the full set of CALPUFF inputs and output files as well as other post-processor files used to generate the results. As indicated in the VISTAS common protocol, regional CALPUFF-ready meteorological files are not being supplied. The modeling information being supplied should be sufficient to allow an independent modeler to fully corroborate the CALPUFF modeling results.

Table 7-1
Rankings at Five Class I Areas
Bowater – Catawba Mill

Class I Area	2001 Delta-Deciview Rank 1-8	2002 Delta-Deciview Rank 1-8	2003 Delta-Deciview Rank 1-8
Linville Gorge	0.958	1.046	1.155
	0.800	0.817	0.944
	0.594	0.700	0.780
	0.576	0.670	0.663
	0.505	0.580	0.601
	0.505	0.562	0.535
	0.488	0.458	0.527
	0.414	**0.450**	0.435
Great Smoky Mts.	1.371	0.598	0.772
	0.604	0.462	0.618
	0.370	0.407	0.597
	0.353	0.362	0.370
	0.298	0.351	0.329
	0.273	0.336	0.291
	0.259	0.316	0.262
	0.251	**0.283**	0.260
Shining Rock	1.530	0.687	0.853
	0.683	0.570	0.802
	0.552	0.442	0.616
	0.363	0.432	0.588
	0.360	0.418	0.410
	0.355	0.368	0.343
	0.332	0.327	0.330
	0.278	0.317	**0.317**
Joyce Kilmer/ Slickrock	0.498	0.608	0.697
	0.443	0.417	0.546
	0.322	0.377	0.281
	0.298	0.301	0.277
	0.281	0.296	0.239
	0.272	0.214	0.211
	0.213	0.199	0.175
	0.173	**0.195**	0.159
Cape Romain	0.505	0.725	0.513
	0.472	0.570	0.366
	0.414	0.488	0.362
	0.343	0.467	0.347
	0.323	0.459	0.314
	0.257	0.356	0.290
	0.256	0.351	0.248
	0.244	**0.348**	0.237

Table 7-2
Summary of CALPUFF Modeling Results
Bowater – Catawba Mill

Class I Area	Distance (km) From Source to Class I Area Boundary	No. of days with impact >0.5 dv in Class I Area: 2001	No. of days with impact >0.5 dv in Class I Area: 2002	No. of days with impact >0.5 dv in Class I Area: 2003	No. of days with impact > 1.0 dv in Class I Area for 3-yr Period	Max. 24-hr impact over 3-yr period 22nd Highest
Shining Rock	180	0/0	0/0	0/0	0/0	0.317
GSM	216	0/0	0/0	0/0	0/0	0.260
Linville Gorge	140	0/0	0/0	0/0	0/0	0.450
Joyce Kilmer	280	0/0	0/0	0/0	0/0	0.187
Cape Romain	230	0/0	0/0	0/0	0/0	0.290

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